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An Analysis of Relationships Existent Between Health Practice, Adjustment, and Physical Performance of Freshmen Women

By Margaret Powell
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(Submitted for publication December, 1946)

BECAUSE people are looking more and more to the schools to develop well integrated individuals, personally, socially, and physically, there seems to be a need for determining what the schools can do to promote this integration. One means of doing this is an analysis of traits related to personal and social adjustment, to health, and to physical performance. Such an analysis will serve to establish interrelationships between traits and will contribute factual evidence upon which school curricula may be based and evaluated in terms of their contribution to the *whole* child.

THE PROBLEM

The purpose of this investigation is to determine (1) the status of health practices, adjustment traits, and physical performance abilities of entering college freshmen women in Texas; (2) relationships existent between the factors of adjustment and of physical performance; (3) relationships existent between current health practice, adjustment, and physical performance ability.

RELATED STUDIES

Although there exists an abundance of published material on health knowledge and attitudes, personality and adjustment, physical performance, capacity, and fitness, there is little which is directly related to this problem.

A report of the study made by Kilander (12) on health knowledge of students was of interest from the standpoint of determining those areas in which health education should be stressed. In his dissertation summary Rook (26) reveals what knowledges and interests students possess when they come to college but makes no statement concerning *what* the student does in light of his knowledge and interest in personal hygiene.

A survey of health practices, knowledges, attitudes, and interests of high school pupils in the state of Massachusetts which was conducted by Southworth, Latimer, and Turner (27) in 1941

An abstract of a doctor of philosophy dissertation presented at New York University, December, 1946.

served to indicate what health activities are now in operation among high school pupils and what factors are related directly to the present status of youth.

In the field of personality adjustment, attempts to measure existent relationships between personality and physique (6), physical condition (9), athletics (28), coeducational physical education (7), and physiological factors (10) were of invaluable aid in supplying a background for this problem even though none, except those by Sperling (28) and Djroup (7), indicated any significant relationship between personality and the factors measured.

It was found that case studies and investigations conducted by Baker and Traphagen (1), Berg (3), Richmond (24), and Thorpe (29), indicated that the factors of home adjustment, health adjustment, social adjustment, and emotional adjustment did play an important role in the development of personality.

Useful data which served to establish correlation between tests used in the physical performance battery and total physical performance; factors about which components of strength and motor ability clustered; and reliability and validity for selected tests of physical performance were contributed by Rogers (25), Larson (13, 14), McCloy (16, 17), O'Connor and Cureton (19), Carpenter (4), Wilson (33), and Cozens (5). Reports of these writers were of particular interest and value as they set forth obtained coefficients of reliability and validity for tests appearing in the physical performance battery and served to justify test selections by the board of experts (22).

METHODS OF INVESTIGATION

A conclusion that the sample population was representative of Sam Houston freshmen women was reached on the basis of analyses of population maps and psychological test scores. The population also showed a high degree of similarity to freshmen women in other Texas teachers' colleges on socio-economic status, Cooperative English Test C2 scores, ACE Psychological Test scores, age, and occupational choices. Inasmuch as there was this much agreement between sample population and freshman population in the other teachers' colleges of Texas and inasmuch as the areas of Texas from which Sam Houston students came included all the established industries of Texas, it seemed reasonable to assume that a high degree of uniformity existed between the groups in other areas of activity and adjustment.

Students selected for testing were entering college freshmen women who were enrolled in required physical education. This permitted a representative sampling as freshmen women must register for physical education unless excused by the college physician. Too,

it made possible the administration of the tests with minimum effort and time. Students were assigned code numbers at the beginning of the program and at no time was an effort made to identify the student by name. It was felt that this procedure would serve to increase accuracy of replies on the subjective tests.

Tests were administered for the measurement of health practice, physical performance ability, and adjustment to 141 freshmen women during regular class hours. No test, other than Physical Performance Battery, required more than one period. Because of the nature of the tests, physical performance testing required one week of practice and consumed three class periods. Not more than three performance tests were given in one period in order not to exert the subject to such an extent as to affect her score.

The three tests selected for the investigation were Johns' Health Practice Inventory (11), Bell's Adjustment Inventory (2), and the Physical Performance Level Battery, compiled by the Research Committee of the National Section on Women's Athletics (22).

Johns reported reliability coefficients of .86 to .88 and validated his test in six ways. Criteria selected for validation of Health Practice Inventory, however, were based on subjective and objective judgments of individuals; the author offers no statistical evidence of validity.

Although reliability for Bell's Adjustment Inventory seems to be satisfactory, there is some difference of opinion concerning its validity. Bell (2) found a reliability of .93 and a validity range of .72 through .90 for his test but Ellis (8), in twelve validity studies of the inventory, discovered that there were eleven negative results against one positive finding. Pedersen (20) concluded from her investigation that the inventory was valid for measuring health adjustment, social adjustment, and home adjustment but not for measuring emotional adjustment. Traxler (30) writes that the inventory is satisfactory for group usage.

Over 70 percent of all schools reporting on Physical Performance Battery gave reliability scores of between .60 and .98. Because the physical performance tests were selected by experts and because, too, they had been validated previously by testing authorities,[1] validity of the battery was not further tested.

Scores for all the tests were tabulated, mean performance, standard deviation, reliability, and interrelationships within tests and for total tests, through use of correlation technique, were determined. Departures from normality were computed for each distribution and levels of significance were established by interpreting standard error of each statistic. Scores of "above average" and "below average"

[1]Refer to "Related Studies," last paragraph.

were correlated to see what relationship existed between these groups. 1.2 sigmas were used as a measure for setting up descriptive ratings. Relationships within tests and between total tests were established through product moment, partial, and multiple correlation. Partialing-out procedure was used to determine the influence of measured factors and multiple correlation was employed to establish the combined influence of variables on each factor.

RESULTS

1. *Health Adjustment Inventory.*—A reliability of .73±.040[2] for the inventory, although not as large as that obtained by the author of the test, .86 to .88, is highly significant and indicates that the test is satisfactory for group usage. Mean performance of the sample population was 132.03±.88 and standard deviation was 15.66 ±.96. Range in scale scores was 87 through 165; possible range of the test was 36 through 180. The inventory is not divided into categories.

Skewness of the health practice distribution of scores was .07±.10. Such an insignificant dispersion of scores from normality was disregarded. Classification of scores according to descriptive ratings yielded these results: unsatisfactory, 5; poor, 30; average, 64; good, 34; and superior, 4.

2. *The Bell Adjustment Inventory.*—This phase of the testing program was not to measure specific personality traits but to evaluate total adjustment. Reliabilities developed for the four categories and for the inventory were: home, .89; health, .69; social, .82; emotional, 76; and total, .92. This is in keeping with reliabilities reported by Tyler (32), Traxler (30), and Turnery and Fee (31), except the one found for the sample population of .69 for health which was slightly lower. Mean scores and standard deviations, respectively, were: home, 6.04 and 5.10; health, 7.78 and 5.10; social, 11.44 and 5.94; emotional, 13.76 and 6.45; and total, 39.0 and 18.0. Descriptive classifications of scores for the inventory showed: unsatisfactory, 7; poor, 24; average, 74; good, 32; and superior, 0.

Examination of part and total score distributions revealed that total adjustment, social adjustment, health adjustment, and home adjustment were significantly skewed. There were, however, but two distributions which showed sufficiently high enough degrees of negative skewness to affect correlation of these traits with other traits of the problem.

Skewness for health, —1.29±.10, and for home adjustment, —.50±.10, did affect their correlation with strength, power, endurance, and health practice. Scattergrams involving these factors contained 41 percent or more of the total test scores in the "superior"

[2]All fluctuations in measurement are expressed as standard error.

or upper range. Since this massing of scores in one area violated the assumption of homoscedascity which states that in all product moment correlations the variables in the columns should be equal, all scores in the "superior" range were eliminated and new correlations for scores which changed progressively up to this range of concentration were computed. Low correlational values still existed. The conclusion was drawn that even though significant skewness for home and health adjustment tests prevented their being regarded as highly refined instruments of measurement for the population, they were unique because, even with extrème scores ruled out, their correlation with all factors of the problem continued to render significant but low coefficients.

Product moment correlations for the four categories warranted the inclusion of all tests except those for social and emotional adjustment. Partial and multiple correlations were calculated to gain further insight into interrelationships.

Home is significantly related to all the adjustment traits and partialing it out markedly influences relationships between these traits. Correlations involving home adjustment are significantly affected by the ruling out of emotional adjustment. Indeed, we may say that emotional adjustment is the factor of greatest influence on home adjustment. Health adjustment has little influence on correlations between home and social, home and emotional, and social and emotional adjustment. The factor with which it does have significant correlation, 1 percent level, is emotional adjustment ($r = .37$). Because of its low correlation with all traits of adjustment, health has a lower multiple correlation than the other traits.

TABLE I

PRODUCT MOMENT, PARTIAL, AND MULTIPLE CORRELATIONS FOR FOUR CATEGORIES OF ADJUSTMENT INVENTORY*

$r_{12} = .35 \pm .075$	$r_{12.3} = .28 \pm .078$	$r_{12.34} = .13 \pm .084$	$R_{1.234} = .76 \pm .049$**
$r_{13} = .37 \pm .073$	$r_{13.2} = .30 \pm .077$	$r_{13.24} = .03 \pm .085$	$R_{2.134} = .42 \pm .070$
$r_{14} = .48 \pm .065$	$r_{14.2} = .40 \pm .071$	$r_{14\,23} = .28 \pm .078$	$R_{3.124} = .71 \pm .042$
$r_{23} = .26 \pm .079$	$r_{23.1} = .15 \pm .083$	$r_{23.14} = .02 \pm .085$	$R_{4.123} = .77 \pm .035$
$r_{24} = .37 \pm .073$	$r_{24.1} = .24 \pm .084$	$r_{24.13} = .19 \pm .082$	
$r_{34} = .72 \pm .041$	$r_{34.1} = .66 \pm .048$	$r_{34.12} = .65 \pm .048$	$N = 138$

* (1) Home Adjustment, (2) Health Adjustment, (3) Social Adjustment, and (4) Emotional Adjustment.

** Standard error.

Traits most highly significant in relationship are emotional and social adjustment. Social adjustment does not affect other correlations significantly as is shown when it is partialed out. Multiple correlation for social adjustment is significant at the 1 percent level and can be employed for predictive purposes to the extent of .71. Also highly significant is the coefficient of multiple correlation for emotional adjustment, $R_{4.123}=.77\pm.035$. Social adjustment and emotional adjustment may each be employed as a criterion for predicting the other. Home adjustment may be also predicted to the extent of .76 if health, social, and emotional adjustment influences are known. Health is an independent factor except for its correlation with emotional adjustment.

3. *Physical Performance Battery.*—According to the report of the Research Committee of the National Section of Women's Athletics (22), not the least part of the responsibility of those directing the education of the high school girl is the training of her body to respond easily to the demands placed upon it. This group believes that each girl, in order to be fit, will need muscular control and coordination, speed and agility of movement, and strength to carry her body and the implements she may use. Using these conditions as a means of setting up objectives for one phase of the fitness program, the Research Committee selected eight tests designed to measure physical fitness of high school girls.

The selected battery includes:

1. Three tests as measures of ability to control the body in accomplishing a useful purpose—standing broad jump, potato race, and basketball thrown for distance. These are grouped in this study under the heading "Power" as they are essentially power events.
2. Three tests as measures for determining strength of arms, shoulder girdle, and abdominal muscles—push-ups, sit-ups, and pull-ups.
3. One test as a measure of agility—10″ squat thrust.
4. One test as a partial measurement of endurance—30″ squat thrust.

As a means of determining the independence of each test as a measurement of the factor to which it was restricted, product moment correlations were computed for the eight tests. These were low enough to justify the inclusion of all factors (.07 to .48), except potato race and broad jump. Correlation between these traits was $r=.71\pm.042$ and shows considerable overlapping of the factors involved. High correlation of these factors, however, was to be expected as both items include elements of dynamic strength, leg strength, and ability to propel body weight through space.

Grouping of scores according to descriptive ratings produced the following: unsatisfactory, 6; poor, 33; average, 64; good, 30; and superior, 11. Skewness of distributions was computed and was interpreted as being too low to affect normality markedly.

Product-moment, partial, and multiple correlations for the four categories of performance were calculated and appear in Table II. All zero-order product moment and all multiple correlations are significant at the 1 percent level.

TABLE II

PRODUCT MOMENT, PARTIAL, AND MULTIPLE CORRELATIONS FOR FOUR CATEGORIES OF PHYSICAL PERFORMANCE BATTERY*

$r_{12} = .46 \pm .066$	$r_{12.3} = .40 \pm .071$	$r_{12.34} = .39 \pm .072$	$R_{1.234} = .62 \pm .042$**
$r_{13} = .41 \pm .070$	$r_{13.2} = .37 \pm .073$	$r_{13.24} = .36 \pm .079$	$R_{2.134} = .53 \pm .060$
$r_{14} = .26 \pm .078$	$r_{14.2} = .10 \pm .084$	$r_{14.23} = .001 \pm .08$	$R_{3.124} = .44 \pm .067$
$r_{23} = .20 \pm .082$	$r_{23.1} = .01 \pm .085$	$r_{23.14} = .03 \pm .085$	$R_{4.123} = .33 \pm .075$
$r_{24} = .39 \pm .071$	$r_{24.1} = .33 \pm .075$	$r_{24.13} = .31 \pm .076$	
$r_{34} = .33 \pm .075$	$r_{34.1} = .12 \pm .088$	$r_{34.12} = .11 \pm .084$	$N = 141$

* (1) Power, (2) Strength, (3) Agility, and (4) Endurance.

** Sampling fluctuations in measurement are expressed as standard error.

Strength and power are significantly related (1 percent level), even when agility and endurance are ruled out but endurance and power relationship, significant at 1 percent level, becomes highly insignificant in partial correlation. Relationship between agility and power, significant at 1 percent level, remains almost unchanged by ruling out strength and endurance. Agility and strength relationship is dependent upon power as is that for endurance and agility. Since partial correlation for power and endurance is insignificant and partial correlation for agility and strength is insignificant, relationship between endurance and agility must be due largely to the factor of power.

None of the factors of physical performance furnish a basis upon which predictions of total physical performance ability can be advanced.

4. *Interrelationships Between Tests.*—The nine traits measured in the problem were correlated to determine what relationship existed between categories of one test and those of another. Only one correlation was as much as $r = .22$, social adjustment and power. The next highest correlation was that for social adjustment and strength,

.15. Health adjustment and health practice had a correlation of —.11. Zero-order product moment, partial, and multiple correlations for total tests appear in Table III. Low correlations indicate that all traits are independent. Product moment and partial correlations for physical performance and adjustment and for physical performance and health practice are low enough to justify the assumption that changes in partial correlation are due to chance phenomena. Relationship between adjustment and health practice ($r = .20$), is significant at the 1 percent level and remains so in partial correlation.

TABLE III

PRODUCT MOMENT, PARTIAL, AND MULTIPLE CORRELATIONS FOR (1) PHYSICAL PERFORMANCE, (2) ADJUSTMENT, AND (3) HEALTH PRACTICE

$r_{12} = .09 \pm .084$	$r_{12.3} = .12 \pm .083$	$R_{1.23} = .19 \pm .081$*
$r_{13} = -.15 \pm .083$	$r_{13.2} = -.17 \pm .082$	$R_{2.13} = .24 \pm .079$
$r_{23} = .20 \pm .081$	$r_{23.1} = .22 \pm .080$	$R_{3.12} = .26 \pm .079$

* Sampling fluctuations in measurement are expressed as standard error.

Because this investigation concerned itself with a comparison of students who were above or below average in physical performance, health practice, and adjustment, scores for these groups were correlated to determine their degree of relationship and to see if any above-average scores on one test correlated highly with above average on another. A comparison of above- and below-average scores altered coefficients of correlation for total scores as follows: health practice and adjustment from $r = .20 \pm .081$ to $r = .21 \pm .082$; physical performance and health practice from $r = -.15 \pm .083$ to $r = -.17 \pm .083$; and physical performance and adjustment from $r = .09 \pm .084$ to $r = .20 \pm .082$. In all correlations except that between physical performance and adjustment, progressive differentiation of scores is altered only slightly by ruling out average scores. A high score on one test does not indicate a high score on another.

CONCLUSIONS

1. Noteworthy relationship exists between home and each trait of adjustment measured in this problem.

2. Emotional adjustment is of greatest influence on home adjustment.

3. Health adjustment affects but slightly the relationship between home and social adjustment, home and emotional adjustment, and social and emotional adjustment. Its highest correlation is with emotional adjustment.

4. Highly significant relationship between social and emotional adjustment is present.

5. Multiple correlation for social adjustment is significant at the 1 percent level and can be employed for predictive purposes to the extent of .71.

6. Emotional adjustment, significantly related to home and social adjustment, is also significantly related to health adjustment.

7. Home adjustment may be predicted to the extent of .76, if social, emotional, and health adjustments are known.

8. Health adjustment cannot be predicted on the basis of known social, emotional, and home adjustments nor can it be used as a basis for predictions concerning adjustment.

9. Strength and power are significantly related and remain so even when agility and endurance are partialed out; power and endurance relationship becomes negligible with the ruling out of agility and strength; and power and agility correlation remains almost unchanged by the ruling out of strength and endurance.

10. Relationship between agility and strength and between agility and endurance is largely dependent upon the factor of power.

11. Agility which involves the ability to change body direction and position in space quickly, contributes to velocity and thus to power.

12. Relationship between factors measured in the problem indicates that categories of one test do not correlate highly with those of another.

13. Relationship between physcial performance and adjustment is insignificant.

14. Physical performance and health practice relationship is significant at the 5 percent level of confidence.

15. The factors showing highest correlation are adjustment and health practice.

16. Relationship between physical performance and adjustment and between physical performance and health practice is so low as to be regarded as due to chance phenomena.

17. Within the limitations of this problem, no marked relationships exist between physical performance ability, health practice, and adjustment.

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Achievement Scales in Six Physical Education Activities for Secondary School Boys

By Clyde Knapp

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(Submitted for publication, July, 1945)

PROBLEM

THE problem attacked is the construction of achievement scales in physical education activities for secondary school boys.

NEED

There is a felt need for development of standards of performance for secondary school boys in events that are reliable, events that can easily be administered as tests, standards that might be used for one measure of physical fitness, for motivation, for classification according to activity needs, and for measuring progress. Such scales would serve as an addition to the general area represented by standards such as the Rogers Physical Capacity Tests (1), the Brace Motor Ability Tests (2), McCloy's Scoring Tables (3), and the Cozens, Trieb, and Neilson Achievement Scales (4). Also, they would provide standards for secondary school use similar to the standards provided for use in the armed forces such as the Navy Standard Test (5), the test used in the Army Specialized Training Program (6), and the test used in the Army Air Forces (7).

CLASSIFICATION

This study adopts the Cozens Best-Fit Index for classification (8). This index classifies according to age, height, and weight, using the formula 2 Age (years) plus .475 Height (inches) plus .16 Weight (pounds). This formula seems satisfactory. It is the result of four years of study involving the influence of the factors of age, height, and weight with secondary school boys in California (9). McCloy (10) has shown that the factor of school grade contains no important information not cared for by age, height, and weight. Russell and Lange (11), after considerable research with classification schemes, support this formula.

Table I presents this classification table.

TABLE I

CLASSIFICATION PLAN FOR SECONDARY SCHOOL BOYS
GRADES 7 TO 12 INCLUSIVE

Exponent	*Age*	*Height**	*Weight*	*Exponent*	*Age*	*Height*	*Weight*
9			53-59	24	11:9-12:2	49½-51½	147-153
10			60-65	25	12:3-12:8	52 -53½	154-159
11			66-71	26	12:9-13:2	54 -55½	160-165
12			72-78	27	13:3-13:8	56 -57½	166-171
13			79-84	28	13:9-14:2	58 -59½	172-178
14			85-90	29	14:3-14:8	60 -62	179-184
15			91-96	30	14:9-15:2	62½-64	185-190
16			97-103	31	15:3-15:8	64½-66	191 up
17			104-109	32	15:9-16:2	66½-68	
18			110-115	33	16:3-16:8	68½-70½	
19			116-121	34	16:9-17:2	71 -72½	
20			122-128	35	17:3-17:8	73 -74½	
21			129-134	36	17:9-18:2	75 up	
22	10:9-11:2	47 Down	135-140	37	18:3-18:8		
23	11:3-11:8	47½-49	141-146	38	18:9-19:2		

* Height is measured in half-inches. The boy must have attained the height listed before the exponent value changes. For example, he remains at 49 until he reaches 49½.

Class	Exponent Value *(Sum of exponents)*
F	69 and below
E	70-74
D	75-78
C	79-82
B	83-87
A	88 and over

SELECTION OF ACTIVITIES TO BE SCALED

In February, 1943, experimentation with the 18 tests recommended by *Physical Fitness Through Physical Education* (12), a publication of the U. S. Office of Education, and with several other tests was started in 23 schools in Wisconsin.

It was desired to scale activities that (1) are reliable as tests, (2) fit into a battery, or two batteries, that may be administered to a class of 40 or 50 boys in one or two class periods, (3) appeal to the interest and imagination of boys, (4) as activities aid in the development of physical fitness, and (5) demand use of the musculature of the arms and shoulders, the mid-section, and the legs and feet.

After giving tests to boys, receiving comments from other teachers who administered the tests, and calculating reliabilities, the writer selected the following six activities to be scaled:

1. Push-ups
2. Squat-jumps
3. Sit-up (90-second time limit)
4. Pull-ups
5. Potato race
6. V-lift

Reliability correlations of .87 or higher were found for each of the activities selected. It was found that the six activities scaled can be administered to a class of 50 boys in two class periods that provide 35 minutes each of time, exclusive of dressing time. The experimenter feels that these activities appeal to the interest and imagination of boys and that the periodic performance of them helps substantially in the development of physical fitness.

COLLECTING DATA

For reliability studies tests were given to 90 or more boys in each activity and repeated within one week. Twenty-three Wisconsin schools reported approximately 20,000 performance records made by boys without particular training or practice. Six schools in southern Wisconsin reported 2,403 tests given and repeated after a two-month interval during which time the boys took part in a physical fitness program including practice in the activities scaled.

STANDARD INSTRUCTIONS

The following standard instructions were used:

1. *Push-ups.*—From standing position place hands on floor and extend legs backward, feet together, back and arms straight with weight supported on hands and toes only. This is the starting position. Lower the body by flexing the arms until the chest nearly touches the floor. Then raise body to the starting position. This counts as one push-up. The head, trunk, and legs should remain in a straight line throughout the movement. The dips shall be done without rest between and shall not count if any part of the body other than toes and hands touches the floor (13).

2. *Squat-jumps.*—The subject starts in a standing position, feet several inches apart with the toe of one foot opposite the heel of the other and with the hands on the top of the head with fingers laced. As the exercise begins the subject squats, sitting momentarily on the rear heel. From this position he immediately springs upward until both knees are straight and both feet have cleared the ground, then returns at once to the squat position with the feet reversed. The trunk should be held as erect as possible throughout. The exercise is continued without pause as long as possible, the position of the feet being alternated on each jump. Each time the subject jumps off the ground, he is credited with one squat-jump. No score is given if the exercise is not properly performed (14).

3. *Sit-ups.*—Lying with back on the floor, fingers of both hands interlaced behind the neck, feet held by another class member, the trunk is raised forward and moved downward, rotating so that the right elbow touches the left knee. Return body to starting position. Next raise trunk as before, excepting that the left elbow touches the right knee. Continue raising the trunk alternately touching left knee with right elbow and right knee with left elbow. Each sit-up, each trunk raise, is one count. The observer, holding the subject's feet, counts

aloud as the exercise progresses. The exercise proceeds for 90 seconds. The score is the number of sit-ups performed in 90 seconds.

4. *Pull-ups.*—Hang on a horizontal bar with arms and legs fully extended, grip of hands optional. From this position, flex the arms, keeping knees straight, until the chin touches the bar; then lower the body to the original position. This is scored as one pull-up. Proceed without rest.

5. *Potato-race.*—A cube of wood 1½ inches on each side is placed in circle number 2 and another placed in circle number 3. Contestant standing behind the starting circle (number 1) runs to circle number 2, picks up the block, returns and places the block in circle number 1, runs to circle number 3, picks up the block, returns and places it in circle number 1. Contestant then picks up the first block, returns it to circle number 3, after which he returns to his starting point behind circle number 1. The elapsed time in seconds and tenths of seconds is the record for the contestant.

Circles are one foot in diameter. The starting point is the front edge of circle number 1. Distance from the starting point to the center of circle number 2 is 34 feet; distance from the starting point to the center of circle number 3 is 42 feet. This leaves a distance of eight feet from the center of circle number 2 to the center of circle number 3.

6. *V-Lift.*—Lie on back with arms folded across chest. Raise legs, keeping knees straight, and raise trunk. Sit in this position (with only one point touching the floor) as long as possible. Score is the number of seconds the position can be held.

TREATMENT OF DATA

Reliability correlations were calculated for the tests given and repeated within one week. These reliabilities were found to be:

Push-ups	.87
Squat-jumps	.88
Sit-ups (90-second time limit)	.88
Pull-ups	.90
Potato-race	.91
V-Lift	.87

The records reported for the boys without particular training or practice were segregated according to each of the six classifications in each of the six events. Frequency distribution tables were made and percentile scores were computed by a short method described by McCloy (15). This method produces as many scores as there are step intervals in the frequency distribution used. To formulate scales with 100 points, the points produced by the percentile calculations were located on graph paper and connected by straight lines. The 100-point scales were read from the graph paper intersections.

This provided scales based upon the performances of untrained and unpracticed boys. Because it was desired to present scales that would represent the performance of boys after participation, for two months, in a physical fitness program, including practice in the activities scaled; and because the number of cases reported in the part of the study which, tested and retested after two months, was considered sufficient to show progress but not sufficient for building scales, the test and retest data were treated as follows:

Means calculated.—Arithmetic means were calculated for the first tests and for the re-tests given after a two months' interval.

Improvement calculated.—Improvement was noted by subtracting the means of the first tests from the corresponding means of the re-tests. Percentage of improvement was noted by dividing the difference between the means of the two tests by the mean of the first test.

Correction based upon average improvement in raw scores rather than upon percentage of improvement.—It is common practice to report progress, or improvement, in percentage. But it was noted that a high percentage of improvement was made in poor performances, a low percentage of improvement in excellent performances, and a medium percentage of improvement in average performances. Examination of the data demonstrated a tendency for improvement in all performances, whether poor, average, excellent, or at points between, to be approximately the same when expressed in raw scores. Thus, improvement expressed by the number of push-ups, squat jumps, sit-ups, and pull-ups, or the length of time for the V-lift is a much more accurate measure of progress than is a mean percentage of improvement. For this reason the scales built upon the data supplied by untrained and unpracticed boys are corrected for expected progress by adding the mean raw score improvement, shown by the test and re-test data, to each performance figure in the scales.

Test and re-test study results, and scale corrections.—Gains shown by the test and re-test study and the corrections made in the several scales are presented in Table II.

TABLE II

PERCENTAGE GAINS AND CORRECTION MADE

Event	*Approximate % gain*	*Number cases*	*Corrections in the several classifications*					
			A	*B*	*C*	*D*	*E*	*F*
Push-ups	30	566	7	6	5	5	4	4
Squat-jumps	28	93	10	10	9	9	8	8
Sit-ups	18	549	7	7	7	6	6	6
Pull-ups	18*	528	1	1	1	1	0	0
Potato-race	Slight loss	236	0	0	0	0	0	0
V-lift	55	431	27	26	22	19	16	15

*In the pull-ups 18 percent represents the gain in classes A, B, C, and D. Classes E and F showed a small loss. Consequently no scale corrections are made in classes E and F in pull-ups.

Statistical significance of gains.—To check statistical significance of gains, experimental coefficients, or critical ratios, were computed. These were found to be:

Sit-ups	1.11
Pull-ups	1.47
Squat-jumps	2.42
Push-ups	2.77
V-lift	3.56

THE ACHIEVEMENT SCALES

Presented here, in Tables III through VIII, are scales showing performance values at 20 five-point intervals.[1]

TABLE III

NUMBER OF PUSH-UPS

Score	*Class A*	*Class B*	*Class C*	*Class D*	*Class E*	*Class F*	*Score*
100	62	57	54	52	46	36	100
95	52	43	42	39	36	29	95
90	46	39	35	33	30	25	90
85	43	36	33	30	26	23	85
80	40	34	30	27	24	21	80
75	38	32	28	26	23	20	75
70	36	31	27	25	22	19	70
65	34	29	25	24	21	18	65
60	33	28	24	23	19		60
55	32	27		22	17	17	55
50	31	26	23	21	16	16	50
45	30	25	22	20		15	45
40	29	24	21	19	15		40
35	28	23	20	18		14	35
30	26	22	19	17	14	13	30
25	25	21	18	16	13	12	25
20	24	19	17	15	12	11	20
15	22	17	16	14	12	10	15
10	19	15	14	12	11	9	10
5	16	13	10	9	9	7	5

TABLE IV

NUMBER OF SQUAT-JUMPS

Score	*Class A*	*Class B*	*Class C*	*Class D*	*Class E*	*Class F*	*Score*
100	94	93	91	89	86	84	100
95	78	77	75	73	70	68	95
90	67	66	64	62	60	57	90
85	62	61	59	57	55	52	85
80	59	56	54	53	51	49	80
75	57	54	52	50	48	47	75
70	54	52	50	48	45	44	70
65	52	50	48	46	43	42	65
60	50	48	46	44	41	40	60
55	48	46	44	42	39	38	55
50	47	45	43	41	38	37	50
45	46	44	42	39	37	36	45
40	44	42	40	38	35	34	40
35	42	40	38	36	33	32	35
30	41	39	37	34	32	31	30
25	38	37	35	32	30	29	25
20	36	35	33	31	29	28	20
15	33	32	31	29	26	26	15
10	31	30	28	27	24	23	10
5	26	25	23	22	19	18	5

[1]Scales showing 100 one-point intervals may be found in the University of Wisconsin library (16).

TABLE V*

NUMBER SIT-UPS COMPLETED IN 90 SECONDS

Score	*Class A*	*Class B*	*Class C*	*Class D*	*Class E*	*Class F*	*Score*
100	84	84	84	68	68	68	100
95	62	62	62	56	56	56	95
90	57	57	57	51	51	51	90
85	55	55	55	49	49	49	85
80	53	53	53	47	47	47	80
75	51	51	51	46	46	46	75
70	50	50	50	44	44	44	70
65	48	48	48	42	42	42	65
60	47	47	47	41	41	41	60
55	46	46	46	40	40	40	55
50	45	45	45	39	39	39	50
45	44	44	44	37	37	37	45
40	42	42	42	36	36	36	40
35	41	41	41	34	34	34	35
30	39	39	39	33	33	33	30
25	38	38	38	32	32	32	25
20	36	36	36	30	30	30	20
15	34	34	34	28	28	28	15
10	31	31	31	25	25	25	10
5	26	26	26	21	21	21	5

*Because sit-up performances did not demonstrate progressive improvement from classification to classification, records for classes A, B, and C were placed in one grouping; those for classes D, E, and F, in another.

TABLE VI

NUMBER OF PULL-UPS

Score	*Class A*	*Class B*	*Class C*	*Class D*	*Class E*	*Class F*	*Score*
100	23	22	20	17	16	16	100
95	17	17	15	14	12	10	95
90	15	14	13	12	10	8	90
85	13	13	12	11	9	7	85
80		12	11	10	7	6	80
75	12	11		9		5	75
70			10	8	6		70
65	11	10	9			4	65
60	10			7	5		60
55		9	8				55
50	9			6	4	3	50
45		8	7				45
40	8			5	3		40
35		7	6			2	35
30	7			4			30
25	6	6	5		2		25
20						1	20
15	5	5	4	3	1		15
10	4	4	3	3			10
5	3	2	2	2			5

TABLE VII

Potato-Race Time in Seconds and Tenths

Score	*Class A*	*Class B*	*Class C*	*Class D*	*Class E*	*Class F*	*Score*
100	19.5	20.5	21.5	21.7	21.9	22.5	100
95	21.6	22.1	22.3	23.0	23.2	24.0	95
90	22.1	22.6	22.8	23.5	24.0	24.7	90
85	22.5	22.9	23.0	24.0	24.5	25.2	85
80	22.8	23.2	23.5	24.3	25.0	25.7	80
75	23.0	23.4	23.7	24.6	25.5	26.2	75
70	23.3	23.7	24.0	24.8	25.7	26.5	70
65	23.5	23.8	24.2	25.1	26.0	26.8	65
60	23.7	24.0	24.4	25.3	26.2	27.0	60
55	24.0	24.2	24.6	25.5	26.5	27.3	55
50	24.2	24.4	24.9	25.7	26.7	27.5	50
45	24.5	24.7	25.1	25.9	26.9	27.7	45
40	24.7	24.9	24.5	26.2	27.2	28.0	40
35	25.1	25.2	25.6	26.4	27.5	28.2	35
30	25.3	25.5	25.9	26.7	27.8	28.6	30
25	25.7	25.8	26.1	27.0	28.1	28.9	25
20	26.1	26.3	26.6	27.5	28.4	29.3	20
15	26.6	26.8	27.1	28.2	28.9	29.8	15
10	27.3	27.5	27.7	29.2	29.5	30.9	10
5	29.1	29.5	30.0	30.0	31.1	31.5	5

TABLE VIII

Number of Seconds V-Lift Is Held

Score	*Class A*	*Class B*	*Class C*	*Class D*	*Class E*	*Class F*	*Score*
100	149	144	136	130	123	117	100
95	128	123	114	109	102	99	95
90	114	110	100	93	86	82	90
85	104	100	90	83	76	72	85
80	98	94	84	77	71	67	80
75	93	89	79	72	66	63	75
70	90	86	76	68	62	59	70
65	85	82	73	63	57	54	65
60	83	80	70	59	52	49	60
55	79	76	65	55	47	44	55
50	77	74	62	53	45	42	50
45	75	72	59	50	42	40	45
40	71	68	56	48	40	38	40
35	69	66	54	46	37	35	35
30	64	61	51	43	35	33	30
25	60	58	48	42	32	30	25
20	55	53	45	39	29	27	20
15	51	48	41	37	27	25	15
10	46	43	36	32	24	22	10
5	39	37	31	27	21	19	5

SUMMARY

Achievement scales, performance standards, in six popular and easily administered physical education activities for boys in secondary schools are presented. Six activities—push-ups, squat-jumps, sit-ups, pull-ups, potato-race, and V-lift—were selected as appropriate for inclusion in a comparative short battery of tests that might serve as one measure of physical fitness and promote, among secondary school boys, interest and practice in activities which develop strength and endurance.

Twenty-three Wisconsin secondary schools supplied approximately 20,000 test records made by untrained and unpracticed boys. Six Wisconsin secondary schools supplied 2,403 records which show performances of untrained and unpracticed boys as well as the performances of these same boys after a period of two months of training in physical fitness programs. Percentile scales have been built upon the results of the 20,000 records made by untrained boys and then corrected for expected progress on the basis of the 2,403 test and re-test records. Thus, the scales represent performances that might be expected of boys in reasonably good physical condition.

The height, weight, and age classification presented by Cozens, Trieb, and Neilson was used. Thirty-six scales are presented, one for each of the classifications in each of the six events scaled.

This study justifies the following conclusions:

1. Two months of training in a physical fitness program produced substantial improvement in push-ups (30 percent), squat-jumps (28 percent), sit-ups in 90 seconds (18 percent), pull-ups (18 percent), and V-lift (55 percent).

2. Two months of training in a physical fitness program produced no improvement in the general average of performance in the potato race.

3. This study seems to confirm the results of the Cozens, Trieb, and Neilson California scales, published in 1936, in push-ups and pull-ups.

4. In potato-race performance Wisconsin boys participating in this study exceeded that of California boys by about 29 percent, or .8 of one standard deviation.

SUGGESTED USE OF SCALES

Use of Tests.—It is suggested that tests in the six activities scaled be given three times during each school year, once shortly after the start of school in the fall, once near the middle of the school

year, and again near the end of the school year. If more frequent check-ups are desired repetitions of tests might be given at intervals of two months.

As a Measure of Physical Fitness.—Tests in the activities may be used as one significant measure of physical fitness. A physical fitness index (PFI) may be calculated by averaging the scores made in each of the tests.

Classification.—Boys may be classified for physical education purposes on the basis of the physical fitness index (PFI) score in the tests. Boys scoring below 35 might be assigned to a conditioning program, boys scoring 35 to 65 inclusive might be assigned to a combination conditioning and recreational or recreational skill program, and boys scoring 66 and above might be assigned to a program of recreation and recreational skills.

Motivation.—Such standards might be a significant force in maintaining a desirable part of the great interest in physical activity for the sake of strength and endurance that was developed during the war years.

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Some Aspects of the Role of Games, Sports, and Recreational Activities in the Culture of Modern Primitive Peoples

I. The New Zealand Maoris

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PURPOSE

THIS study is an attempt to learn, from an examination of the literature on primitive peoples, what role the games, sports, and recreational activities played in relation to the culture as a whole. Such a study, it is hoped, will serve the dual purpose of making this material a part of the historical backgrounds in our professional literature, and possibly (by implication) cast some light on the current problems involved in the integration of such activities with our culture. An understanding and appreciation of the implications inherent in such activities in the lives of our own people is sometimes lacking. Perhaps, taken into the laboratory of the social scientist and studied under differing conditions of life, in various sized groups and under variously equipped technologies, their analysis may lead to a more objective reconsideration of analogous phenomena in our own culture.

The ultimate purposes to be served in this and following investigations are (1) to show that sports, games, and recreational activities form a universal and fundamental element of human culture; and (2) to illustrate how immensely more complex than is often supposed are the forces that produce the activities commonly described as recreational. We are interested in tracing natural, intrinsic, and recurrent relationships, not in collecting isolated items.[1]

PREVIOUS APPROACHES

Many of the great writers and philosophers of antiquity[2] were at one time or another concerned with the idea of primitivism.

1Many well known anthropologists have made studies on the games of various groups. Stewart Culin, as Director of the Museum of Archaeology and Palaeontology, University of Pennsylvania, is author of numerous studies on games. Pitt-Rivers, E. B. Tylor, Erland Nordenskiold and many others have also written on this subject.

2Any comprehensive knowledge of the globe is relatively recent. Before 1642 New Zealand had not been sighted and knowledge of Oceania began with Bougainville and Cook.

Lovejoy and Boas (12) have classified the general treatments of the subject under the two categories of "chronological primitivism" and "cultural primitivism."

Under the heading of chronological primitivism is that great body of literature concerned with the idea as to the time—past, present, or future—at which the most excellent condition of human life, or the best state of the world in general, might be supposed to occur. Cultural primitivism is the expression of a profound discontent of the civilized with civilization in general or at least some of its characteristic aspects. This idea has had its roots in human nature since the civilizing process began, since men living in any place and in any stage of cultural development have always visualized a "golden age" in which life was less complicated and therefore more beautiful and more satisfying.

The cerebrations of Plato and Aristotle, of Cicero and Lucretius, as well as of Rousseau and his "noble savage"[3] are equally far removed from the purposes of this study. We approach the study of our modern primitives in the spirit of humility and humanity as well as historical inquiry. We are profoundly interested in the antecedents of these people, and in the people themselves, as our neighbors; as human beings with whom we share the world and the world's problems, and with whom we seek to share an understanding which is the ultimate hope of that world.

The vast storehouse of material gathered by anthropologists and ethnologists was certainly used by earlier writers who sought the answers to the explanation of play activities, games, and sports, as sociological, biological, or psychological phenomena. The contributions made to our understanding by such thoughtful and creative thinkers as Schiller, Spencer, Groos, Hall, Patrick, Lee, Gulick, Bucher, and Dewey, are very great. However, a dynamic and evolving profession needs constantly to re-evaluate its principles and practices in the light of the most modern advances and discoveries in all the sciences. This may be especially true with regard to the use of anthropological data in view of Balfour's (1) statement to the effect that anthropology as an emancipated science is of relatively recent date.

PHYSICAL ACTIVITIES (RECREATIONAL) IN THE CULTURAL PATTERN

Boas (7) defines culture as embracing all manifestations of the social habits of a community, the products of human activities as

[3]Anthropologists have warned that it is naive in the extreme to attempt to equate the modern primitive groups with the primeval savage.

determined by these habits, and the reactions of the individual as affected by the habits of the group. In his examination of leisure as an aspect of culture, Boas assures us that amusements in great variety occur and at all age levels, from the play of young children with each other and with parents, to the activities of adults in contests of dexterity and skill; with set rules for playing, and involving arranged competitions between individuals and among groups.

Malinowski's (15) theory is that culture is the handiwork of man, the medium through which he achieves his ends of establishing a standard of safety, comfort, and prosperity. And further that culture can only be understood as a means to an end, the instrumentality through which the basic needs of all human beings are transformed, in the process of their satisfaction, into cultural values. Malinowski gives consideration to the relationship of physical activities to culture from several angles: the need for movement and activity in the human organism which is a general imperative imposed by human nature upon civilization; the systems of bodily activities connected with economics, political organization, exploration of the environment and contact with other communities which are all related to individual muscular tensions and their surplus energy. In addition he reminds us that we have a body of organized activities such as sports, games, dances, and festivities, where a regulated and established muscular and nervous activity becomes an end in itself. And it is these activities which should be studied and analyzed in terms of their educational value, and their function as preparation for economic skills, as well as their relationship to certain physiological needs which might be termed artistic.

Lowie's (13) definition presents a slight variation in that he identifies culture as the sum total of what an individual acquires from his society. It is the legacy from the past, conveyed by formal or informal education, of those beliefs, customs, artistic norms, food-habits, and crafts which are a part of the society in which he lives.

Lowie's estimate of the part played in cultural history by sports and games may be assumed by statements made in the Introduction to his book on the *History of Ethnological Theory*. He reminds the field worker that as the naturalist cannot confine himself to the examination of beautiful butterflies, so must the ethnographer ignore nothing that belongs to the social tradition. He goes on to say that as faithful a recording must be made of a boy's game on stilts as of the cosmogonies of Tahitian priests, and that children at play may reveal as much of basic cultural process as do the metaphysical speculations of their elders.

Mead (16) would have us call it "human culture," the whole complex of traditional behavior which has been developed by the

human race and is successively learned by each generation. Mead urges her students in anthropology, in their examination of the educational process in primitive peoples, to find out what games are played, and whether or not such play is supervised and stimulated by adults. They are urged to inform themselves as to which kinds of play are encouraged and which disapproved; how many different kinds of play there are. Also, what are the habits which the children's world enforces and how do these compare with the habits which the adults enforce in children by the encouragement of some and the suppression of others, and how these in turn compare with the habits which are displayed in adult life.

ESSENTIAL LIMITATIONS

Mead reminds us that no single item of behavior found among the members of a group sharing a common culture, and in greater or lesser degree among members of a given society, is relevant out of its context. From this point of view certain facets of the total cultural picture must be presented before a detailed examination of the play life and physical activities is made. Some understanding of the nature of the material environment within which the group obtained its livelihood, the social and political structure of the society in which they lived, and some knowledge of the educational process, are indispensable.

However, Herskovits (9) points out that it is entirely possible to study a particular aspect of the culture or a single item of social behavior without studying all of the culture. And while the inclusion of material dealing with all the traditional rules of social behavior, religious beliefs, and other masses of interrelated, ethnographic data are essential in a rounded study of a single culture, they may be an encumbrance in a comparative approach to materials pertaining to a single aspect of the culture.

In a study of the inter-relationships of games, sports, and recreational activities with the culture of peoples it is impossible to separate these from the arts of music and dance, since they are performed in response to the same motor impulse. One and all are expressions of man, and confirm and corroborate in their own individual ways his reactions to stimuli (19). However, for the purposes of this study we shall limit our emphasis to sports and games, particularly of the vigorous muscular type.

METHOD OF APPROACH

In determining an approach to a study of the role of games, sports, and recreational activities it appears logical to use an analysis somewhat similar to that in common use today (17). Briefly we

wish to know: What urges must be satisfied? What activities appear to contribute to this satisfaction? What environmental conditions prevail which offer a means for achieving satisfaction.

With these questions in mind we have set up three main categories for investigation by means of which we hope to ascertain how nearly the primitive society, under study, found answers to these questions within its own framework. We have attempted to guard against offering either a string of obvious and therefore useless generalizations, or against emphasizing a thesis to the point of distortion.

1. *Urges to be satisfied.*—Starting with the premise that man achieves nothing without muscular action and a definite orientation of the nervous system, we separate this urge to activity into two broad divisions:

a. Innate.

b. Derived.

The innate urge to activity is only a point of departure; the derived urges include the whole gamut of physical activities through which man satisfies his bodily urges under cultural conditions.

2. *Activities which satisfy these urges:*

a. Compulsive. Under this are included all activities which are essential to the procurement of food, clothing, and shelter, as well as protection against external enemies and dangers.

b. Voluntary. In this category come all activities engaged in for motives not present in the activities listed as compulsive.

3. *The human or institutional organization providing means for achieving satisfaction:*

a. Home and family.

b. Tribe, village, or community.

To avoid broad generalizations it seems logical to begin our study with one particular ethnic group. In selecting the Maoris of New Zealand for our initial study, we were influenced by the fact that they have been one of the most intensively studied of modern primitive groups.[4]

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[4]Elsdon Best is considered the most famous of New Zealand anthropologists. For more than fifteen years prior to his appointment as ethnologist at the Dominion Museum (Wellington) "he lived among the primitive Maoris and had learned their language as well as their habits of thought." He was more than a casual observer and hence when he reports on their games he does so with an understanding and appreciation which could only come from long association. He sensed the fact that it was important to realize not only that a certain thing was done, but also how and why it was done.

PHYSICAL ATTRIBUTES OF THE MAORI

The Maoris have been described many times as warlike, and this was true in that the young Maori grew up to regard warfare as one of the necessary elements of tribal life. However, their psychology of war was more that of a seriously taken game, governed by elaborate rules of honor. To think of Maori warfare in terms of the modern methods of total war, that is, the coldly calculated mass destruction of soldiers, civilians, and cities alike, is erroneous. There were proper seasons for war as there were seasons for harvesting and other activities, and the fighting was controlled by accepted rules and courtesies of behavior that put the Maori at a real disadvantage in fighting the white man.

In speaking of the Maoris, Keesing (10, p. 18) says:

> It is difficult to sum up the characteristics displayed by these early folk, other than in general terms. The main strain is Polynesian, restless, virile, and warlike, of high intelligence and splendid physique; with this a secondary Melanesian strain of darker colour, less aggressive perhaps and with rather more negroid characteristics. From this blending has come the Maori race, physically a splendid people of many types, and mentally active, intelligent, and highly adaptable.

Firth (8, pp. 36-37) gives an excellent description of the people:

> Physically the Maori was of a type which enabled him to cope vigorously with the exigencies of a somewhat rough life. Fairly tall, and well built, he cultivated by war, games, and manly exercises the qualities of strength, speed, quickness, and endurance. These were always turned to account in the pursuits of daily life, and earned social approbation for the person who displayed them.
>
> The Maori may be said to have had a cult of fitness, but such an expression must not be pushed too far. By social approval, by the instruction of elders, the young man strove to render himself strong and agile. It is erroneous, however, to interpret all his dances, games and practice in the exercises of war as rational and deliberately planned attempts to secure the proper working of the bodily functions and to further the ends of race improvement. The savage is no scientific hygienist. The Maori was fit because of his mode of life; he did not think out his mode of life in order to be fit.

MAORI RELIGION NOT AN INHIBITING INFLUENCE

There was no concept in Maori myth or religion that corresponded to that of "puritanism" or "asceticism" (2). Hence, attention to the care of the body with respect to development, and enjoyment, was ever sanctioned and approved.

> . . . The Maori believed himself to be the descendant of supernatural beings; his ultimate forebears were the personified forms of natural phenomena: his soul came originally from Io the Parent. Thus man has inherited a modicum of ira atua (Supernormal life, the Divine nature). This belief led to very singular results; it led to the conviction that this spark of the Divine in man is

not only extremely tapu,[5] but also that it represented the true vitality of man, his physical, mental, moral, and spiritual welfare. This spark is the Mauri ora, or toi ora, of man, and it is this quality that needs to be very carefully protected from any polluting agency, the effect of any such contact being disastrous. For inasmuch as such quality is the subtle vivifying and protective agent, should it by any means become defiled, then its physical basis, man, becomes helpless; he is left in a condition of spiritual destitution; he lies open to every baneful influence; every shaft of magic and other evil powers . . . His hold on life thus becomes precarious; his only hope is to restore the condition of tapu that alone represents safety and general welfare (3, p. 41).

No edifices were built by the Maori in which to perform religious ceremonies. He preferred to conduct his ritual out-of-doors. The *tohunga* served many functions in addition to that of priestly expert; he was doctor, military leader, and agricultural expert (4).

The Maori could probably not be said to have used prayer (at least in the sense that we understand the word), but he did have endless charms or incantations *(karakia)* which were supposed to influence the gods indirectly, and which entered into every phase and activity of his daily life. Such charms were frequently used in playing games, in causing a kite to fly successfully, or in influencing the outcome of a dart-throwing contest or wrestling match.

The more important of the incantations were known and delivered only by the priestly experts, but every man must possess some knowledge of such charms for his own protection in averting evil and insuring success in his occupational endeavors.

The lesson to be read from all collected data is simply this: That Maori religion was no well-defined system of beliefs and practices. It was a loose, free-and-easy series of beliefs and ceremonies that left each individual at liberty to please himself to a great extent. So long as he observed the rules of tapu he might please himself as to his dealings with the gods (4, p. 70).

IMPORTANCE OF PHYSICAL TRAINING IN MAORI EDUCATION AND CHILD CARE

The central idea of the process of education among the Maori was that the youth was the property of the tribe, its coming strength, and therefore must be trained on the tribal behalf (8). The child was placed under the protection of the gods at an early age and the proper

[5]The Maori did not possess a code of civil law and it was necessary that he should have some institution to act as a corrective and coherent power in his social life. This was the function of *tapu*, a series of prohibitions that entered into all activities of native life. Disregard of *tapu* meant disaster to the individual, inflicted not by his fellow tribesmen but by the gods. Fear of the gods was the strongest force in Maori life, since they represented the vital power and force of all *tapu* and were thus the backbone of the system. *Tapu* is sometimes explained as bearing the meaning of "sacred" but this is a minor or secondary meaning . . . a *tapu* place is a prohibited place; a *tapu* person one who must keep aloof from others; a *tapu* house one that cannot be used for common purposes, as cooking or eating. Definite ceremonies and the recitation of certain formulae were necessary for the removal of a condition of *tapu* from a place or person.

magic formulae recited to endow it with health, strength, cleverness, and courage, and to ensure the retention of these qualities. From the earliest age, home instruction was an important element in the life of the child. All relatives, parents, grandparents, brothers and sisters, were interested and helpful. The social and familial organization made such cooperation possible.

The Maori child was by virtue of his birth a member of a series of social groups. The initial family group, *whanau,* might begin with a father and mother and their children. As the children grew and married and in turn became parents, they remained as members of the family group. The *whanau* might comprise fifty to one hundred individuals. Upon attaining this number the *whanau* formed itself into a *hapu,* and the *Iwi* (tribe) was thus composed of different *hapu* groups, and might contain anywhere from three hundred to a thousand or more people. It should be remembered that a Maori tribe *(Iwi)* is made up of all the descendants of the ancestor who arrived in New Zealand in a particular canoe.[6]

Maori mothers strove to produce symmetry of form in their children, and infants were subjected to a kind of massage called *toto,* which was believed to aid in developing comeliness of form. Girls were encouraged to practice certain exercises and indulge in forms of recreation believed to insure grace of action. Makereti (14) gives some interesting information about the physical care of infants. The body of the infant, including arms, legs, and head, was carefully massaged to insure a good shape. This same massage was applied to the joints to make them supple. The infant's nose was pressed gently between the thumb and forefinger to prevent the child from being flat-nosed. His body was bound in the *pueru*[7] to keep the back straight, and the legs were bandaged together fairly tightly to prevent them from being crooked. She reports that round shoulders and bow-legs were unknown among the Maori.

From the age of six to that of fifteen or sixteen, the father undertook the boy's training, with much help from the grandfather (14). He was taught the customs and arts of his people. He learned to hunt and snare birds (of which there were more than two hundred species), how to make traps for eels, nets for sea fishing, and how

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[6]Pride in descent from one of the original canoes which were believed to have brought Polynesian settlers to the shores of New Zealand about 1350 A.D. "is still an abiding reality to the Maori, a haven both of status and stability in an ever-changing world" (20).

All successful enterprises initiated by the *pakeha* (white man) in New Zealand, with relation to the Maori, have been conducted with the idea firmly in mind of the strength of tribal loyalties among the natives. Questions of land ownership, establishment of church and school districts, arrangements for competition in sports, all were done in the light of this fundamental principle of Maori life (20).

[7]Cloak.

to dive for the crayfish and fresh-water mussels. He had learned a good deal, by the age of eight or nine, about these and other methods of procuring food. A boy accompanied his relatives to the forest, watched them cutting down trees and preparing logs for houses or hewing them out for canoes; there he learned to choose trees for a canoe or house, and how to take them long distances to the village, river, or lake.

In addition he learned the *haka* or war dances. He was trained in the use of all war weapons when quite young by the old men, and his training went on all through his life, at first with harmless sticks, and then with weapons. He learned how to hold himself as a warrior, to use the long two-handled weapon and the short-handled stone weapon for close combat.

All athletic games and contests were considered useful in training youth to bear arms. The Maori's fondness for hand-to-hand combats made it imperative that a youth possess not only strength and endurance but a high degree of agility and excellent coordination of hand, body, and eye.

> One of the first lessons to be learned by a youth in this course of training was that which enabled him to detect slight muscular movements that betokened the delivery of thrust or blow by his adversary. He would be taught to keep his eyes fixed on the shoulder, or on the big toe of the advanced foot of his opponent according to what weapons were being used. When, in so watching the big toe of the forward planted foot . . . he saw it suddenly clinch downward as though to grip the earth, he knew that action was about to be taken, and a blow or thrust delivered; thus he was prepared to parry or avoid the delivery, and possibly to deliver a blow ere his adversary could recover arms. It is said that, when two good spearmen became warmly engaged, there was a constant clatter as the spear shafts met in rapid passes, feints and parries (5, p. 10).

The girl was quick to learn all the duties which her mother performed. At the age of eight or ten she could get up early to light the fire. She learned to prepare the *kumara* and *taro* for cooking. She would go to the forest with her mother to gather sticks for firewood; she learned how to clear away the weeds among the plants and between the rows. She helped her mother to cut and carry bundles of flax, and learned how to prepare flax for making the baskets in which the food was eaten.

Girls joined in all the games, swimming, running, and *poi* dances. At about fourteen to eighteen girls were taught to *pukana* (roll the eyes), and walk with a *parepare* movement of the hips (14). This moving gait of the hips is the same as that practiced by some modern civilized girls, only more marked.

Long before any contact with the white man the Maori had evolved an institution in the form of a School of Learning *(whare*

wananga). In the winter months a few of the superior young men of the village, those of approved intelligence and tested power of memory, were assembled to receive instruction. Best (4) classifies the subjects taught as (1) high-class ritual and other lore; (2) historical and other matters of lesser importance; (3) the arts of black magic.

The overall picture that emerges from a study of the Maori, is of the parent as friend, companion, counselor, and teacher to his child. Children slept all together in the same *whare* (house) with their parents and grandparents. They went to sleep at night listening to stories of the brave deeds of their ancestors. Nothing was hidden from Maori children; all conversation was open before them. They were fearless, since they met with love everywhere.

> Games taught them sharpness of eye and quickness of movement. In the winter of an evening they gathered in the wharetapere, a house where games were played, or in the wharepuni (meeting house), and played games and practiced the haka posture dances, and peruperu and other war dances, which they all enjoyed. They learned whai, i.e., cat's cradle, and many other games too numerous to mention (14, p. 153).

THE RECREATIONAL MOTIF IN ECONOMIC PURSUITS

A striking feature of Maori culture is the way in which every aspect of their economic life was permeated with a definite element of recreation. Whether engaged in fishing, bird-snaring, cultivation of the fields, or building a house or a canoe, the occasion was marked by activities which we could definitely classify as recreational. This condition is in such marked contrast to the economic endeavors of most individuals in our highly industrialized civilization that it seems worth examining rather fully. In proportion as a people have incorporated into the daily pattern of living the recreational activities and outlets which we in physical education believe to be essential, they will have less need for an external body of organized activities to fill the need.

We also find in our study of the Maori that the physical skills learned in childhood and as young adults, are closely inter-related with their economic, social, and recreational life. There was never a sharp division between the uses to which these skills were put (18). For instance, a child was taught to swim at an early age. This was a matter of self-protection, true, but it was also a great source of pleasure to the child and adult in game situations, and an indispensable asset in his economic pursuits as fisherman and navigator.

We shall attempt to illustrate this interrelationship further by pointing out elements in certain economic pursuits which supplied to the Maori the satisfaction of the urge to activity, the social urge

to companionship, and the psychological urge for competition and opportunity to excel.

In speaking of the fowling activities of the Maori, Best (6, p. 187) says:

> In most cases the people would abandon their villages at such times and camp near the scene of operations, in or near the forest; the Maori liked to so take his hunuku or family encumbrances, human and otherwise, with him when engaged in such tasks, and so, with families and dogs they made a picnic of work.

Firth (8) comments that an important stimulus to relieve the tedium of protracted effort and introduce a sparkle of interest into the occupation was the pleasure of work with company. Makereti (14) describes what a fine sight it was to see an *ohu*[8] at work with the *ko*[9] on a large *kumara* cultivation, working and moving in unison to the accompaniment of a chant sung by a man who acted as leader of the party, the workers joining in. She goes on to describe how, when the chant begins, each man places his right foot on the foot-rest of his *ko,* forcing its point into the soil; he then presses the handle down and backwards to loosen the earth. When the *ko* is pulled out he puts the point in again a certain distance from the first hole, turns his body, puts his left foot on the rest and again pushes the *ko* into the ground, loosening the earth as before. Thus a small mound is formed in which the *kumara* tuber will be planted. The row of men use the *ko* in unison, and upon the completion of one row, take a step back and repeat the performance.

The following description of a shark-fishing expedition serves well to illustrate why it was looked upon as a great sport as well as a valuable means of adding to the food supply. Since the season was limited to two days per year (and the penalty for beginning before the signal was given was to split the offender's canoe), preparations began well in advance in order that all might be in readiness at the exact moment. All was animation and gaiety as adults of every age joined in the work while the youngsters amused themselves with various games.

> The report of the signal . . . at once caused a commotion in the camp, followed by a shout of 'Light the oven fires!' The canoes were quickly launched with gear aboard. Soon after sunset the order was given to start, and off the canoes went, to the refrain of huka, ka huka! This is a light and quick stroke of the paddle intended to churn the water into foam rather than to give much speed. The canoe paddled leisurely along, the men reserving their strength for the great race and struggle of later on—for there was always great competition to secure the first fish. On arrival at the rendezvous the fleet was found in position. The new canoe took up its allotted station and kept it, as did the others, by the aid of a long pole stuck in the mud. All waited for high

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8Ohu—a "gang" of men.

9Ko—a digging implement with handle six to ten feet long.

water, indulging meanwhile in loud talking and laughter. It was believed that the strong spring tide swept immense numbers of sharks into harbor, and far up the rivers and creeks, so that when the tide ebbed, the returning fish were intercepted by the fleet.

As the time of high water approached, the talking ceased, and there was a dead silence throughout the fleet. Presently the chief of the observer's canoe whispered 'Kua whati te mata o te tai,' 'the tide has turned.' Almost immediately afterwards Popota stood up in his canoe and shouted out in stentorian tones 'Huakina!' 'Charge!' Then followed a most exciting race for the fishing ground, and for the mataika, the first fish—always of great symbolic significance to the Maori. All through the fleet natives were shouting 'Hoea, tiaia, toia patua, ana kumea' or, roughly translated, 'stick it in, drag it along, press it down, haul it along—' rhythmic shouts of encouragement to the straining paddles. The last two words mark deep strong strokes of the paddle, and the word 'ana' is to have the effect of making the stroke more strenuous. Thus at the words 'ana toia, ana pahia,' etc., every ounce must be put into the stroke. It was a brilliant moonlight night, and the whole fleet could be seen racing furiously for the channel, shouting, yelling, and cheering as they went. (8, pp. 216-217).

The recreational motive was used as a very efficient agent in helping to weld the efforts of the workers into a coherent and purposive scheme of activity. There were working chants or songs to accompany every type of activity. These may be classified into four general categories:

1. Canoe-hauling songs.
2. Canoe-paddling songs.
3. Songs used when digging the fields for cultivation.
4. Songs used in miscellaneous operations such as the grinding of adzes.

These were considered definite stimuli to efficient performance of the task at hand.

The "feast" of the Maori must not be considered as simply a satisfaction of physical needs; it was always an integral part of some social activity. It is involved not simply with the consumption of food but with a complex set of activities surrounding the event. Firth (8) gives the following general classifications of Maori feasts:

1. Marking some crisis of life such as birth, death, marriage, or the tattooing ceremony.
2. Marking events of social or economic importance such as the opening of the house of learning or the harvest season.
3. Economic feasts marking the commencement or completion of the building of a communal house.
4. Feasts facilitating social integration such as those to celebrate the making of peace, the arrival of visitors, or the repayment of obligations.

THE "ARTS OF PLEASURE AND OF JOYFULNESS"[10]

The Maori explains all games and amusements by attributing their origin to mythical persons of remote times (5). Among some tribes all games as well as the art of flute playing are attributed to Rautakari and Raukatamea, who lived in the far-off misty time when man was young upon the earth.

The fact that the Maori never evolved or borrowed any system of writing or hieroglyphs caused them to carefully preserve their unwritten literature and to rely heavily on games, pastimes, and vocal music to conserve their ancient lore. For this reason and because of the habits of work and domestic economy of the people, considerable prominence was given to all forms of recreation. During periods of crop planting and harvesting the Maoris had little time for leisure, but after the crops were gathered and stored they gave themselves wholeheartedly to the "Arts of pleasure and of joyfulness."

Although all amusements are referred to as pertaining to the *whare tapere*,[11] this is largely a figurative expression since special houses were not constructed for this purpose. The *whare tapere* is described as any large house in the village commonly used as a place of assembly for the people; as a house wherein to lodge visitors, and where young people could meet in the evenings for purposes of games and recreation. Any house sufficiently large might be used for the purpose. Since the greatest use was given to such a house in the evenings or in unseasonable weather, torches of *maire* wood were highly prized for use as lighting since a bundle of *maire* wood sticks set upright and kindled at the top gave a steady clear flame with practically no smoke.

In fine weather or when the assemblage was too large to be accommodated within a house, entertainments, games, and dances were held on the *marae* or plaza of the village. Firth (8) calls the *marae* the center of normal village life. It was the playground and meeting-place: children gathered there for their games; *haka* and *poi* dances were practiced there; youths were instructed in manly sports and the bearing of arms; adults sat about in groups and talked in the leisure hours of the afternoon. To the natives it was much more than a simple open space (grass covered or worn to the bare earth) in the village, or a convenient assembly ground; it was bound up with the most vital social happenings, with warmth and hospitality, with stately and dignified ceremonial.

Amusements entered into the proceedings of all assemblies of the people except those pertaining to active warfare. An occasion

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10A well known Maori saying—*Nga mahi a te rehia, a te harakoa*—"The arts of pleasure and of joyfulness."

11Literally a play house.

commemorating birth, death, marriage, crop planting, harvesting, fishing and hunting, peace making, and many other matters was the signal for games for the children and youth and specially scheduled contests.

The Maori apparently did not indulge in gambling in connection with his games, but was always willing to recite a special charm to influence his luck in a game of skill (6). A practice reminiscent of modern American baseball players was observed in connection with the wrestler before a match. He would expectorate into his hand, close it, and repeat a charm to insure the desired strength!

Best (5) has tabulated the recreational activities of the Maori into four broad divisions, as follows:

1. Recreational activities of children, indulged in freely and joyously by those too young to take part in domestic tasks.

2. Informal meetings of the members of two or more families, or of the young people of the village in a house or on the plaza in the evening or during free time.

3. Ceremonial feasts, harvest festivals, political meetings, or any manner of large meeting where the members of one or more sub-tribes or tribes gathered together and where many forms of amusement were indulged in, including contests between different members or sections of the community.

4. Arranged contests between members of different village communities for the purpose of playing a match. The contests might consist of combative sports such as wrestling or a trial of skill with weapons, or they might take the form of canoe races, posture dances, dart throwing, or kite flying. Contestants would arrive accompanied by friends and relatives of all ages. These gatherings were greatly enjoyed as social meetings.

SELECTED SPORTS OF THE MAORI

It has been indicated previously that the games and sports of the Maori were to a considerable extent tied up with their economic life. Nevertheless at night and during the off-season (in their leisure time) there were definite arrangements made in regard to recreational activities. Best (5) tells us that although special recreation houses were not constructed in villages, the young folk of both sexes would meet at night in a house large enough for their purpose and there pass the evening in singing, dancing, and storytelling. Often the elders would join them in playing games.

During their leisure time the young men of the village entered into contests in such activities as running, jumping, throwing, climbing, boxing, wrestling, swimming, canoeing, and the like. A number

of their leisure-time activities are particularly interesting to us in physical education.

The Maoris did not use the bow and arrow; their main weapon was the spear. Very naturally training in this skill commenced at an early age, with practice in using the fragile pomas grass. Along with the art of thrusting the spear came instruction in the art of *karo,* that is, of parrying and dodging. A remarkable degree of dexterity was attained. The training sometimes took the form of a contest where two opponents would stand approximately fifty feet apart, each with a supply of reeds, or darts. One contestant threw his complete supply, which his opponent dodged or parried, sometimes with the use of the short stick called a *karo,* sometimes with only the use of the hands. The process was then reversed. The darts were sometimes straight stems of *manuka,* about six feet long and an inch and an eighth in diameter. They were thrown both overhand and underhand.

Many variations of the game are described. Playing with short staves about two feet in length, four players would sit opposite another four players, moving the sticks up and down in cadence to a song chanted by the group and at a given signal would throw them across the center line to be caught by the others.

In still another form all participants save one stood or sat in a circle, facing inward, the remaining one in the center. Each individual in the circle had a stick about three feet long in his hand. These would then be thrown at the man in the center who endeavored to catch every one. He was not permitted to move from the middle of the ring, but players were not allowed to throw sticks from behind his back. As he caught the sticks he immediately threw them to players in the circle who had no stick. A director, acting as instructor, stood outside the circle and coached the participants as to the throwing movements. This was considered excellent exercise and training for the youngsters who, in a few years, might be compelled to catch or parry the spears of enemies.

Aquatic sports of all types formed an important part of the recreational life of the Maori. Like most Polynesians they were completely at home in the water, and indulged in swimming, diving, surf-riding, and canoe racing. Although evidence exists that four types of swimming were known to the early Maoris (the side, breast, and overhand strokes, as well as swimming on the back), the most frequently used was the side stroke.

From the records examined we learn that these people had a real fondness for jumping into the water from great heights, and among the ingenious devices used to provide this pleasure were two which have been well described by many travelers and observers.

Of particular interest was the stationary water jump which was in fact a springless springboard, constructed by placing a strong post upright at the edge of a lake or the sea, and placing on this post a log which extended onto the shore and projected out over the water; and which was placed at an angle of 25 or 30 degrees from the level of the water. The height from the log to the water would be approximately 15 feet. The women and children were especially fond of this sport and would endlessly repeat the process of running to the top of the log, jumping into the water (always feet first) and swimming briskly to shore.

A second and more daring form of expression along this line was the *Moari* or giant stride which was usually, although not invariably, set up near the edge of a body of water. A modern replica of this apparatus may be found on many playgrounds. A tall pole, usually the trunk of a particular type of local pine tree, was set up and to the top were attached a dozen long ropes made of flax. The exact form of construction and manipulation apparently varied from place to place, but several devices are reported as being employed to keep the rope from twisting around the pole at the top. In certain areas it was the custom to place a knot at the lower end of the rope and insert a short cross-stick, which was used in some cases as a seat, and in others simply grasped by the hands. The participants held tightly to the rope or stick and ran swiftly around the land side of the staff. When they had gained sufficient momentum and were swinging high over the water, they would let go and drop feet first into the water.

Maori children seem to take to the water as though it was their natural element, and under favorable circumstances learned to swim as soon as they learned to walk. Small rafts were sometimes made for children, which they poled or paddled.

Floats (poito) were sometimes fastened to a child when learning to swim. Matured gourds were placed on an elevated stage to dry, but no holes were made in them for extraction of the contents, which amounted to little when dried. The gourds were then placed in nets and secured to the child by means of cords, or in some cases, such a gourd float (pioto hue) was merely clasped to the breast with one arm, while the other was used to swim with (5, p. 21).

The technique of surf riding among the Maori was quite similar to that now used on the coast of Southern California. The rider (out some distance from shore) grasped a board or plank, about three feet long, by its forward end and waited to catch the crest of a large wave, whereupon he was shot ashore with considerable speed. Skilled performers also rode the waves with outstretched arms unaided by a board.

This sport was indulged in by youth and adults, including females, and one might see thirty or forty riders coming in together on a big wave (5, p. 21).

Small canoes were also used for surf riding by two or three persons. Having taken the canoe some distance seaward, the riders paddled swiftly shoreward as a large wave approached. The canoe was not allowed to mount the crest of the wave, or the small craft would probably capsize; it was kept in front of the crest, riding the breast of the wave, hence the stern was higher than the bow. One person always steered the canoe. Should the bow swerve off the course, the man at the bow endeavored with his paddle, to bring her head around again, and if the steerer saw that the bow paddle could not effect this, then he jumped overboard and held onto the stern. With this drag at the stern, the bow paddle could now bring her head round, and hold it so.

In addition to handling themselves proficiently in the water, part of the training given young children of both sexes was the use of the paddle with small canoes. If a canoe capsized, this merely added enjoyment to the activity. Canoe racing, paddling, and sailing were enthusiastically indulged in and created intense excitement among contestants and spectators alike.

Maori canoe races were, in the early years of European settlement, a common feature at local sport meetings (5, p. 28).

THE MAORI HAKA OR POSTURE DANCE

Haka is the generic term for many styles of posture dancing, each with its specific name and style and varying greatly in tone and delivery. While some were pleasantly mild, others were virulent, incisive, and savage. Certain *haka* were performed by both sexes, some by women only, and others by men alone. Maori children had their simple *haka* which could be considered equivalent to the nursery rhymes of our children.

Nothing less than a complete and individual study could do justice to the role of the *haka* in the cultural pattern of the Maori. It offered wide scope for expression of talent, not only as a dancer but as a poet and musician. From the vantage point of our civilization its chief value might be found in its use as a "safety valve." Physiologically it supplied vigorous muscular activity, as well as the acquisition of grace and skill in precision of movement, for young and old alike. Psychologically it was a socially sanctioned outlet for feelings of ecstacy, grief, joy, anger, and revenge. Sociologically it served as a universally enjoyed amusement, and as a means of displaying hospitality and friendliness: it was invaluable as a lead-up to courtship and marriage, and as a means of unifying tribal sentiment in both war and peace.

An excellent idea of the part played by the haka dance in the life of the Maori has been given us by Best (4, p. 134):

> Of all forms of amusement indulged in by the Maori in former times perhaps none were so much appreciated as the haka, or posture dance. The haka may be described as a series of rhythmical movements of limbs and body accompanied by a song, or at least by a series of short refrains. This recreation was indulged in frequently and by both sexes. Public feeling often found expression in the form of a haka, and they were organized in connection with a multitude of subjects. Where we write to the papers to ventilate or right some wrong or grievance, the Maori composes a haka directed against his detractor or opponent. Where we sedately shake hands with a party of guests on their arrival, the Maori chanted rhythmic refrains to them, accompanied by vigorous and equally rhythmical action: this as a welcome.

SUMMARY

While this study is concerned with the sports, games, and recreational activities of a single native people, we hope that it has pointed to valid conclusions with regard to the Maori and thus may suggest significant lines of inquiry. Our method of approach through an examination of the sports, games, and recreational life of peoples, is based on the conviction that it is above all in the leisure and play aspects of human culture that the hard crust of conservatism that divides one people from another is at its weakest (11). We further believe that an awareness of the common heritage which all men share in this area of human experience can contribute to that increased understanding and sympathy which is our most potent weapon against the forces of intolerance, bigotry and prejudice.

There was in Maori education a deliberate attempt at adjustment to environment, a training in social activities and practical endeavor through which the child became a useful and responsible member of the community. These people firmly believed that physical welfare formed the basis for all activity, educational or otherwise, and fully recognized the value of games and sports for training in self-confidence and self-control. The *marae* was a rich ground for the cultivation not only of physical skills but of opportunity for development of resourcefulness, adaptability, and initiative. Self-reliance and the will to persevere and improve are traits of character deliberately encouraged through this means.

Although living in a stone age of technological development, the Maoris had a well integrated recreational life. Skill and bravery were fully recognized as enhancing the position of the individual and the importance of the tribe. They had developed a great variety of games and amusements which were intelligently used, supervised,

encouraged and promoted, and which served the following clearly defined purposes:

1. Training for war.
2. Acquiring skill and grace.
3. Contributing to economic efficiency.
4. Being fundamental to their recreational life.
5. A means of promoting tribal loyalty and solidarity.
6. An outlet for healthy competitive urges in an otherwise cooperatively organized social structure.

It is a temptation to idealize Maori life in retrospect, but, stressing the positive factors the student of their culture is forced to acknowledge that the Maori approach to life was realistic and matter of fact, and that its values were many: joy in the rhythm of dance, song, and the game of war; appreciation of fine craftsmanship, and a tenacious holding to the values of social cooperation in work and play.

IMPLICATIONS FOR THE PROFESSION

The scientific study of man reveals that in all normal human beings there exist certain fundamental urges, through which he participates in the struggle for survival and fulfillment. These basic urges are, by nature, neither moral nor immoral. The old idea of innate instincts, good and evil, and separable into neat categories, finds no support from modern psychological discoveries. If we have the concept of such urges as multiple in character and needing an environment which will foster their exercise and satisfaction in socially desirable ways, we come to understand that their natural strength can be a most helpful instrument for the building of personality.

Starting with the premise that without muscular action and a definite orientation of the nervous system, man achieves nothing, the position of the physical educator and the recreation worker then becomes more clearly defined. He must be interested in assuring for every human being opportunity for the satisfaction of the basic urge for movement and activity, and through concerted effort and careful planning must attempt to help the individual to fulfill the many derived needs of creativity, participation, and self-expression that form the more complex pattern growing out of this basic urge.

Anthropological data offer ample evidence that this urge for activity is basic, and that in the process of its satisfaction an endless variety of cultural patterns have been formed representing play, games, sports, dance, and festivities in amazing variety; and this in

all ethnic groups which have been studied. We are assured, therefore, that this cultural pattern will persist. The obligation is for us in the profession to see that it is channeled toward constructive rather than destructive ends. We have come to understand that this basic urge is too vital an instrument for the growth and flowering of man to be neglected or ignored. History, ancient and contemporary, furnishes too many examples of what may happen in such circumstances.

That the original interests of the profession were limited in scope will be admitted by its most partisan protagonists, but that it has been gradually working toward more scientific ends, and toward a fuller understanding of human needs, must also be acknowledged.

Physical education should now take its place as a legitimate branch of the family of sciences or disciplines which are involved in the study of man. The fact that as a junior member of the family it has much to learn from the old and venerable members, does not invalidate nor minimize the contribution it has to make. Nor does the assumption of such a role any longer require the bumptious assertiveness that marks a sense of inferiority. The realization of how cultural phenomena interlock with others, and the utilization of the cumulative knowledge of all studies of humanists and scientists is perhaps the most hopeful sign of current civilization.

Culture, representing the widest context of human behavior, is as vital an area of study for the physical educator as it is for the psychologist, the historian, the linguist, the philosopher, the theologian, the anthropologist. We need an understanding of the processes and products of culture, and its relation to basic facts of human psychology and the organic processes of the human body. By what other means can we understand the relationships of our specific activities to humanity and society as a whole?

Physical education, while formulating principles of professedly general application, has concerned itself almost exclusively with the study of such phenomena in the civilized world of the present and its historical antecedents. Surely there can be no assumption of universality, no laying down of propositions of general validity for mankind as a whole, until the concepts and inquiries of the profession are extended to peoples in different parts of the world and with different cultural patterns.

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Tobacco Smoking, Strength, and Muscular Endurance

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(Submitted for publication, March, 1947)

THE writer has been inquisitive for some time regarding the ability of the cigarette to give to the smoker the stimulus or "lift" often attributed to it. There is a possibility that smoking stimulates some persons and does not do the same for others. It is known that there is an elevation of blood sugars when smoking takes place (1, 2, 3). Johnson (4) noticed this sugar rise and believed that nicotine stimulates the adrenal medulla through the sympathetic nervous system, thus increasing the output of adrenalin. Sollman (5) attributed rise in blood pressure to the addition of adrenalin to the system, and where the output was briefly increased, this was followed by a marked and enduring decrease. Dale and Laidlow (6), animal experimenters, discovered that nicotine injections produced adrenalin which was later followed by a diminished secretion. Houssay and Molinelli (7) noticed temporary blood sugar increase due to adrenalin. Caponetto (8) reported hyperglycemia, and Burnstein and Goldenberg (9), the same in response to nicotine. Lundberg and Lundberg (10) found that action of nicotine on the sympathetic nervous system and the adrenal glands released part of the glycogen stored in the liver and muscles causing temporary hyperglycemia. Haggard and Greenberg (11) reported a rise in blood sugars with a corresponding rise in the respiratory quotient. McCormick (12) showed that there is a glycemic response to nicotine which decreased muscular energy by dissipating glycogen reserves. Mendenhall (13), Couch (14), Homewood (15), and Herrill (16) have demonstrated that smoking may be first a stimulant and later a depressant. These experiments indicated that any sugar rise is soon lost, with a further depression resulting.

EXPERIMENTAL CONTENT AND PROCEDURE

In order to measure an individual's ability to receive stimulation or become depressed from tobacco smoking, certain constants were introduced involving fatigue. To ascertain the change in physical condition due to fatigue, the strength of flexor muscles of the hand and forearm was measured by means of a hand dynamometer. By concentrating all of the available grip strength into squeezing this device, a poundage score between 0 and 200 could be registered as of any one moment.

In this experiment, fifteen college men between the ages of twenty and twenty-five were measured under the same operating conditions. All were smokers of cigarettes and varied in their indulgence per day, from occasional to heavy smoking. All subjects knew how to smoke.

Each subject to be tested was ushered into a private office so that distracting stimuli were eliminated as far as possible. The hand dynamometer was placed in the subject's unskilled hand and he squeezed the instrument with all his strength. Only individuals who were friends of the writer were used, for they could be relied upon to exert their maximum effort each time they gripped. Two grip strength trials were given before the test to determine the beginning grip or starting point, that is, the best grip before the fatigue process began.

With the time checked carefully, and the record card covered from the subject's view, the grip strength was taken consecutively every ten seconds for six minutes. At no time was the subject allowed to know his score. This process of maximum gripping for thirty-six times (six minutes) was fatiguing, and the score dropped gradually. At the end of six minutes the subject sat down and rested, smoking his own brand of cigarettes for three minutes in an accustomed manner.[1] At the end of three minutes he continued as before, squeezing the dynamometer every ten seconds for four more minutes. After taking 24 grips (four minutes) he sat down and rested for five minutes. At the end of five minutes the final grip was taken to note the recovery.

Because individuals are apt to vary slightly in their power to concentrate their effort, the six scores for each minute were averaged, giving a mean figure per minute for each of the six minutes. The same was done for the four-minute period following the three-minute rest as shown in Table I. A characteristic curve started with the subject's best grip, dropped through six minutes of testing, recovered a little after a three-minute time lapse of resting and smoking; then it dropped through four minutes of gripping, and thenceforth recovered some after five minutes of rest. The percentage drop from the best grip to the grip registered at the end of six fatiguing minutes was calculated. After the three-minute rest period the fatigue drop was figured. Since the drop was not as great, this figure represented a percentage recovery over the six-minute period. The next four minutes of gripping resulted in a certain percentage of drop, as of the original score, before the five-minute rest period. After the five-minute rest, the grip strength score was calculated and represented a percent recovery back to the original score. This was the method used in measuring subjects when smoking during the three-minute

[1]Each subject smoked approximately fifty percent of one cigarette.

TABLE 1

GRIP RECORD MEAN OF SIX TRIALS PER MINUTE

Name	Test	Grip at Start	1	2	3	4	5	6	3-Minute Rest	1	2	3	4
H. W.	*S	130	127	122	109	110	116	111		123	112	110	107
	**R	128	126	115	113	110	111	109		120	110	109	106
M. B.	S	124	121	109	109	98	102	100		111	93	97	97
	R	132	118	109	100	101	98	103		113	100	104	100
R. G., Jr.	S	115	107	99	94	94	90	87		96	90	92	87
	R	116	108	104	99	97	99	95		103	94	96	96
R. G.	S	130	118	113	103	100	105	99		119	100	98	97
	R	115	112	107	105	107	105	103		114	104	108	101
F. C.	S	124	117	117	106	103	99	96		104	93	91	91
	R	132	115	106	102	100	99	96		109	101	95	89
C. S.	S	123	113	104	100	100	103	101		107	102	101	101
	R	124	117	113	106	104	103	104		111	104	102	105
M. N.	S	118	105	101	97	100	98	96		111	101	97	91
	R	123	116	105	106	104	102	103		105	98	96	92
G. H.	S	145	137	138	137	132	132	122		132	122	122	119
	R	152	145	127	137	126	128	131		137	126	127	131
H. C.	S	130	125	109	108	107	105	100		117	108	103	97
	R	134	132	123	122	115	104	107		123	114	107	103
M. H.	S	138	134	126	125	122	122	118		125	121	116	115
	R	135	132	128	123	124	125	120		134	125	122	121
E. T.	S	128	121	115	114	114	112	111		124	117	117	111
	R	134	129	122	122	119	120	116		129	126	119	112
J. L.	S	120	109	98	91	87	78	78		90	82	72	69
	R	120	105	94	92	86	83	84		92	87	83	79
B. T.	S	134	120	115	114	118	114	112		124	114	115	118
	R	132	129	120	117	115	115	114		124	119	118	118
R. K.	S	165	149	131	129	126	134	132		141	135	130	131
	R	162	138	135	133	133	136	142		153	140	140	136
E. S.	S	142	134	134	133	136	134	129		140	128	129	128
	R	145	130	125	118	121	119	116		127	114	116	110
Mean	S	131	122	115	111	110	110	106		118	108	106	104
	R	132	123	116	113	111	110	109		120	111	109	107

* Smoking Test.
** Rest—Only Test.

rest period. The same procedure was followed in measuring the individual during the three-minute period of rest only.

Since physical condition varies all of the time, the probability of getting a subject in the same physical status for a second test was practically impossible. Therefore, percentages were calculated within the separate curves of each of the fifteen subjects. The individuals in this experiment were given the second test two days later at the same time of day. The room, the atmosphere, and the experimental procedures were kept the same as in the previous test. The only difference in the second test was that no cigarette was smoked during the three-minute rest period. In the second test, it was possible to set up a situation in which the recovery after six minutes was due entirely to rest, whereas, in the first test it was due to both smoking and rest. Further, in the first test the final recovery was due to rest with lingering smoke effects, and in the second test, to rest only. Table II shows the results as calculated. Chart I is the mean graph for the smoking and rest, and rest-only curves of the fifteen subjects, designed to illustrate Table II more clearly.

By comparison of the percent recovery of the first test (due to smoking and rest) and a percent recovery of the second test (due to rest only), it was possible to tell whether an individual received more of a stimulation from the cigarette and rest, than from the rest alone. For example, where a percent recovery was obtained after three minutes' time elapse due to smoking and rest which was higher than that of rest only, the subject would appear to have received a stimulation or "lift" from the cigarette. In addition, if the final recovery (after five minutes) was greater in the rest-only curve than in the smoke-and-rest curve, the individual might have been depressed due to smoking the cigarette.

DISCUSSION OF RESULTS

An examination of Table II shows that some individuals received a stimulation from smoking and rest, while others did not. Although graphs were constructed on all fifteen individuals, only the mean graph is included here. It is included to show the trend of the individual subjects, and that smoking in this experiment may or may not be an immediate stimulant.[2] In these cases, smoking appears as

[2]This mean graph for the scores of the fifteen college men shows a recovery (as of the original score) of 47 percent after three minutes of smoking and rest, and the same percent recovery for rest only. The graph also illustrates a 67 percent recovery (as of the original score) in the smoke-and-rest curve after the five-minute rest at the end, and an 89 percent recovery in the rest-only curve. This represents a difference of 22 percent in the final score of the two curves.

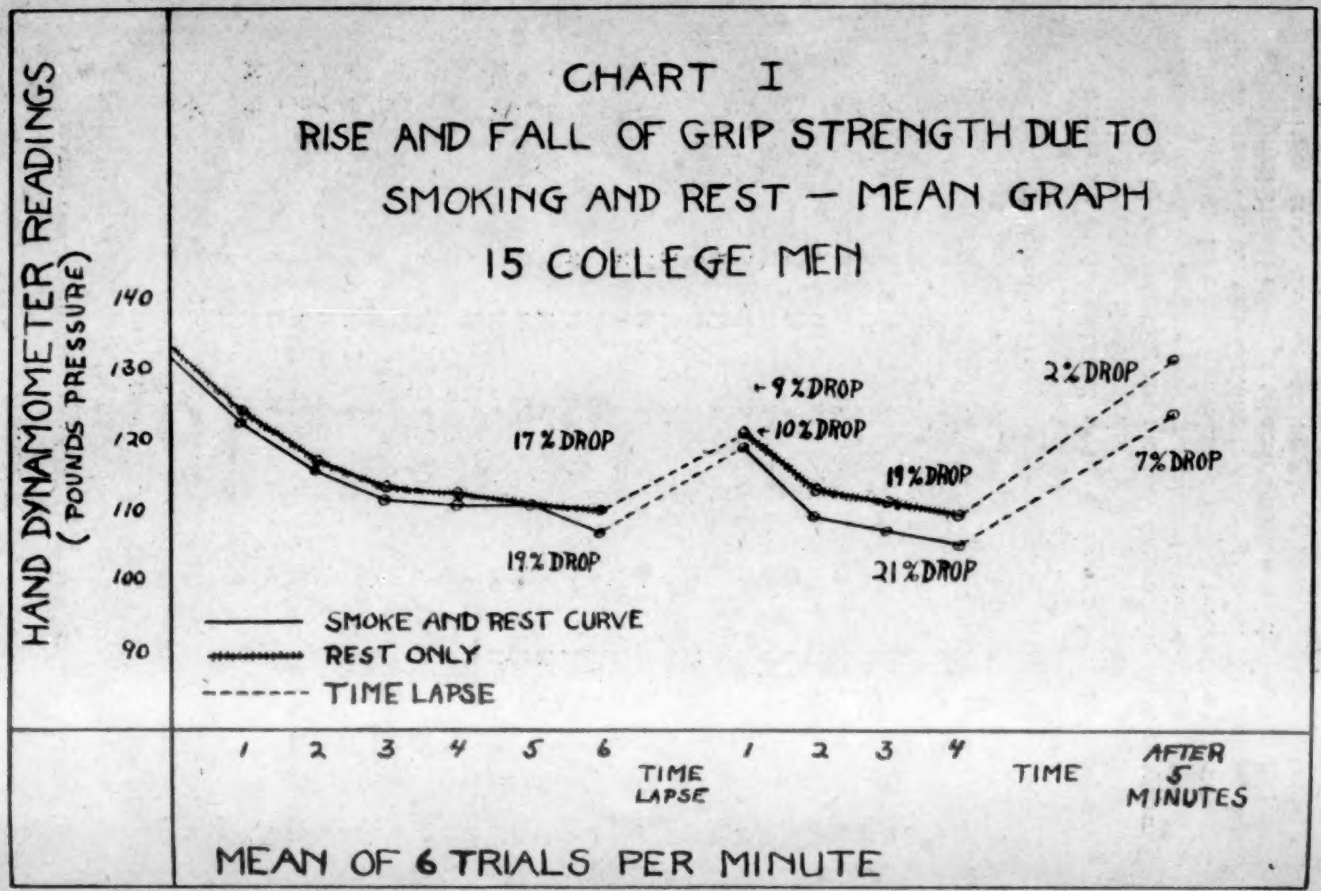
CHART I
RISE AND FALL OF GRIP STRENGTH DUE TO
SMOKING AND REST — MEAN GRAPH
15 COLLEGE MEN
HAND DYNAMOMETER READINGS
(POUNDS PRESSURE)
140
130
120
110
100
90
17% DROP
19% DROP
9% DROP
10% DROP
19% DROP
21% DROP
2% DROP
7% DROP
SMOKE AND REST CURVE
REST ONLY
TIME LAPSE
1 2 3 4 5 6
TIME LAPSE
1 2 3 4
TIME
AFTER 5 MINUTES
MEAN OF 6 TRIALS PER MINUTE

TABLE II

RELATIONSHIP OF SMOKING AND REST ONLY AND PERCENT RECOVERY

Name	Test	% Drop Before S or R	% Drop After S or R	% Recovery	% Drop Before 5 min.	Grip After 5 min.	% Drop After 5 min.	% Recovery
H. W.	*S	15%	5%	67%	18%	126	3%	83
	**R	15	6	60	18	128	—	100
M. B.	S	19	11	42	22	114	8	64
	R	22	14	36	24	128	3	87
R. G. Jr.	S	24	17	29	24	98	15	37
	R	18	11	39	17	110	5	80
R. G.	S	24	8	67	25	110	15	40
	R	10	1	90	12	117	—	102
F. C.	S	23	16	30	27	107	14	48
	R	27	17	37	33	115	13	61
C. S.	S	18	13	28	18	113	8	56
	R	16	10	37	15	121	2	87
M. N.	S	19	6	68	23	112	5	78
	R	16	15	6	25	120	2	92
G. H.	S	16	6	62	18	142	2	89
	R	14	10	29	14	156	—	103
H. C.	S	23	10	57	25	118	9	64
	R	20	8	60	23	125	7	70
M. H.	S	14	9	36	17	135	1	99
	R	11	1	99	10	140	—	104
E. T.	S	13	3	77	13	136	—	106
	R	13	4	69	16	144	—	107
J. L.	S	35	25	29	42	93	22	48
	R	30	23	23	34	103	14	59
B. T.	S	16	7	56	12	134	—	100
	R	14	6	57	11	135	—	102
R. K.	S	20	15	25	21	147	11	48
	R	12	6	50	16	157	3	81
E. S.	S	9	1	89	10	140	1	90
	R	20	12	40	24	142	2	92
M.	S	19	10	47	21	122	7	67
	R	17	9	47	19	130	2	89

* Smoking and Rest Test

** Rest-Only Test

a depressant in the end, and whatever sugar rise there may be in some individuals to elevate their physiological activity seems to be overcome by the action of the nicotine drug on the nervous system. This is shown by lagging grip strength and lessened ability to recover from fatigue. In every individual case the percentage of recovery was greater in the non-smoking instances than on the smoking day. This physiological effect of tobacco smoking would seem to indicate abstinence from nicotine during the physical education training routine, when maximum endurance is desired.

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Research Abstracts

PREPARED FOR THE
NATIONAL COUNCIL OF THE RESEARCH SECTION

By Granville B. Johnson

Mental Hygiene

Orr, Douglass W., "The Veteran and His Neuro-Psychiatric Diagnosis," *Mental Hygiene*, 1946, 30, 628.

This is of interest to anyone who has been in the service, and while not exactly of interest to all in our field, the "Do's" given to persons of the P. N. classification should also be good medicine for each of us. A shortened version is presented. Please note No. 4 and No. 5.

1. Swallow your pride and go home.
2. Tell your people frankly that you have been nervous.
3. Get a job or go back to school.
4. Take up a hobby.
5. Get your exercise.
6. Find some one who does "understand."
7. What happened to you shouldn't have happened to a dog, but it did; it's water under the bridge; forget it—*V. W. Lapp.*

Zerfoss, Karl P., "Mental Hygiene and Physical Education," *Mental Hygiene*, 1946, 30, 277.

This article was written from the viewpoint of a YMCA physical education director and points out several factors of mental hygiene which each instructor should be conscious of.

1. Our program should provide for activities where a chance of success is available. (A fat boy should not be expected to climb a 16-foot rope in front of an audience.)

2. In choosing teams pick them by numbers from a list. If the choice is made by choosing up sides, someone always is last.

3. Base the program of physical activity on the individual needs of the boy. This can be partly achieved by knowing the boy.

The writer points out that no new psychology is necessary, but that each physical education instructor should be observing and ready to aid his charges to an emotionally sound life.—*V. W. Lapp.*

Louttit, C. M., "The School as A Mental Hygiene Factor," *Mental Hygiene*, 1947, 31, 50.

Dr. Louttit assumes that our society is interested in developing youth into mature and stable adults. He lists the following traits as desirable in these mature adults:

1. Personal happiness and satisfaction.
2. Social competence and maturity.
3. Control of emotion and drives.
4. Occupational and recreational skills.
5. Stability and constancy of purpose and action.
6. Adequacy and security.

These traits should be brought about by the interplay of the home, the community, and the school. Since the author is concerned mainly with the school's contribution in his article, he points out that the school is an arm of society and that the school will function as the public desires it to do.

The teacher is the key person and should educate the child to the fundamentals of social living and enforce the school rules for group living with the *child in mind*. Rule enforcement should not become the prime objective. The teacher is also concerned with the individual differences and should try to give stability, affection, and strength as needed. Knowing the needs of the child would overshadow the subject matter in the author's mind.

The teacher should be a mature, stable person who is willing to:

1. Accept the children as they are.
2. Make every child feel that he is an important member of the class.
3. Avoid feelings of being threatened by either the children or his colleagues.
4. Have a sense of humor.
5. Have tolerance for people and ideas which may be in conflict with his.
6. Have enthusiam for the job to be done.
7. Work for professional growth.
8. Be a member of the community and help with its problems.
9. Look after his own personal appearance.
10. Maintain sound physical health.

Dr. Louttit concludes that, "the child must be taught to the maximum of his ability those habits and that knowledge necessary for successful social living, while at the same time, every precaution must be taken to preserve his personal integrity and to assure continued growth of his personality."—*V. W. Lapp.*

Davis, John E., "Motivational Values of Periodic Award Days and Play Festivals for Psychotic Patients," *Mental Hygiene,* 1944, 28, 251.

In this paper the author points out that athletics of the physical activity type provided only temporary relief or aid to the patients at the Perry Point Veterans Administration Facility. It was decided that a long-time program would have to be formulated so that interest and effort could be sustained over longer periods of time. With this objective in mind the Award Day exercises were devised.

The new program provided for championships in the following events: baseball, volleyball, calisthenics, duckpins, tenpins, horseshoes, golf, tennis, croquet, table tennis, shuffleboard, code ball, softball, and modifications of various games. Medals were awarded for individual accomplishment, certificates of achievement were presented to members of championship teams, awards were made to the men showing the greatest improvement, and awards were also made to those who interested the most patients in recreational activity. In short, awards were made liberally from as many angles as the physical director could justify.

The result was a program that would extend the challenge of interest from a day-to-day to a year-to-year basis. Mr. Davis gives as examples case histories showing how this long-range program gradually secured the interest of certain patients and produced a definite participation until in many cases, individual and team championships resulted. This awakened the indi-

vidual awareness in the world and helped suppress the ailments which were the cause of hospitalization.

Public recognition in the form of awards, publicity in hospital papers, team membership, etc., seems to have a normalizing effect on psychotic individuals. These same techniques might be of value in keeping normal people from becoming psychotic.—*V. W. Lapp.*

Education

Boardman, Walter S., "A Corporation as a Means of Serving Youth Interests," *J. Educ. Sociol.*, 1945, 18, 407.

A study of the youth needs in Oceanside, Long Island, showed the need for some corporate body whose entire function would be the study and promotion of the interests of youth. The following principles were decided upon:

1. The words and thought of juvenile delinquency should be kept out of discussion and planning. The approach must be positive.

2. A maximum opportunity for youthful enterprise should be provided with adults serving in an advisory capacity only.

3. Very wide community support of whatever is to be done is essential. This seemed to mean a separate community association for the purpose.

4. To protect adults serving in any capacity, there must be protection against liability which seemed to mean a corporate type of association.

5. This corporate body should represent a complete cross section of the community.

The usual corporation officers were elected and the board of directors consisted of Catholic, Protestant, and Hebrew clergy, American Legion members, PTA, school administrators, and several substantial businessmen.

The corporation provided and is operating a large youth center with two main youth groups: the juniors (age 11-14) and the seniors (age 14-18). This type of corporate organization seems to function well—*V. W. Lapp.*

Mackay, James L. "Juvenile Welfare in Relation to Home and School," *J. Educ. Sociol.*, 1945, 19, 111.

The author points out that the school is the agency that reaches more children than most others and that it has an indirect effect upon the home. About the time a student enters high school the boy or girl is also undergoing definite changes which have an effect upon their thinking.

The home is in a position to become a guidance agency in which may be found the security and the affection much needed at this time. By substituting guidance for restraint the normal rebellion of youth during this period may be avoided. The school, aided by the home and parents, can become the center of adolescent activity including the "teen towns" and "teenage social centers." These functions should welcome the investigations of parents and should have adult supervision. Mr. Mackay seems to feel that a far-reaching school program might be of help in combating juvenile delinquency which seems to be at a maximum in the high school age group.—*V. W. Lapp.*

Telford, Letty, and Jane Stewart, "The Neighborhood Is Our Classroom," *J. Educ. Sociol.* 1947, 20, 281.

This article is about an elementary and an intermediate school in the Detroit Area. The children were divided up into squads of five and given specific tasks to do in a survey of their neighborhood. As a result of this technique, social and civic agencies became interested in the findings of the

children and aided the neighborhood in the solution of some of its problems. Play spaces and a park resulted, and students from Wayne University helped with the supervision of these areas.

The story of this project is well told and will serve to broaden the horizons of many in our profession.—*V. W. Lapp.*

Binder, Rudolph M., "The Basic Defect in Our Education," *J. Educ. Sociol.* 1947, 20, 376.

In this article Professor Binder has taken the viewpoint that our educational system should deal realistically with the basic *law of cause and effect.* He points out that this should be taught in all subjects. In science if certain hydrogen atoms are combined with oxygen atoms, water is the end product. The result is sure if the natural law for mixing these two elements is followed. Our moral laws work with the same surety, and this should be pointed out in history and literature. We can indicate that Hitler's end, whatever it was, apparently was not glorious.

In conclusion Professor Binder says, "Every evildoer must reckon with one fact, the sting in his conscience which will never leave him. He may be forgiven and accepted by society, but he will never be rid of that sting which pursues him all his life. That is the law of cause and effect. It is the law of nature and as such is inexorable."—*V. W. Lapp.*

Herring, John. W., "Direction Finders for New York Communities," *J. Educ. Sociol.* 1946, 20, 254.

Mr. Herring has set up ten points as an indication of the kind of communities we want. The key sentence of each of the paragraphs is listed. Physical educators should be interested in these.

1. We want a community that is a community.
2. We want a community that seems itself, looks forward, and says, "we can."
3. We want a community in which there is abundance, security, opportunity, and equity in sharing.
4. We want a community that practices democracy between social and economic groups, races, creeds.
5. We want a community giving the finest educational opportunity to everyone, to each man according to his needs and capacity.
6. We want a community in which members find deep satisfaction in arts, in recreation, in social living.
7. We want a community that understands self-government and practices self-government with skill and steady responsibility.
8. We want a community in which the best possible use is made of every resource to promote health and welfare.
9. We want a community physically planned to contribute most fully to the good life.
10. We want a community of homes, of happy families, a place for children and youth, for parents, for elderly persons, a community of all, by all, for all.—*V. W. Lapp.*

Nutrition

Holmes, Arthur D., and Carleton P. Jones. "Stability of Reduced Ascorbic Acid in Mares' Milk," *J. Nutrition*, 1947, 34, 113.

Fifteen samples of mares' milk with initial potencies of from 86 mg. to 161 mg. of reduced ascorbic acid per liter were stored in the dark at 10°C.

They were assayed at daily or longer intervals. Four samples observed for 10 days lost an average of 2.5 mg. per liter daily. Four samples stored 20 days lost 1.8 mg. per day. Two stored 28 days lost 1.3 mg. daily and three observed for 33 days lost 1.1 mg. per liter per day. These data show that the rate of loss of reduced ascorbic acid from mares' milk is only a fraction of the rate of loss from cows' milk.—*Wistar Institute.*

Oldham, Helen G., Elizabeth Lounds, Thelma Porter. "Riboflavin Excretions and Test-Dose Returns of Young Women During Periods of Positive and Negative Nitrogen Balance," *J. Nutrition*, 1947, 34, 69.

Three young women were maintained on weighed diets for 3 periods of 10 days each. The daily nitrogen intakes were approximately 5 gm. during the first period, 19 gr. during the second and 5 gm. during the third. The daily riboflavin intakes were approximately 1000 ug. during the first period, 1200 to 1400 ug. during the second, and 1000 ug. during the third. Urinary riboflavin and nitrogen excretions were determined daily. The amounts in foods and feces were determined on individual five-day composites. Daily nitrogen balances were calculated by subtracting daily urinary excretions and average daily fecal excretions from average daily intakes. The majority of the nitrogen balances were negative during the periods of low nitrogen intake and all were positive during the periods of high-nitrogen intake. Daily riboflavin excretions varied inversely with the coexistent nitrogen balances. They represented from approximately 40 to 60% of the riboflavin. Test doses given at the end of each period showed the same inverse relationship with the nitrogen balances in two of the subjects. Fecal riboflavin excretions did not appear to be influenced by the alterations in the composition of the diet and showed no relationship to the nitrogen balances.—*Wistar Institute.*

Anatomy

dePaula, Waldomiro, "Frequency of the Omentum Lienale in Man," *Anat. Rec.*, 1947, 98, 401.

The frequency of a peritoneal fold extending over the diaphragmatic surface of the spleen (omentum lienale, presplenic fold, etc.) in man was studied in 114 cadavers (white, negroes, mulattoes, and yellow) of both sexes. The omentum was found well individualized in 48 cases; no significant ethical or sexual differences were noted.

The omentum lienale is frequent enough to be included in the description of peritoneal formations in standard anatomical textbooks.—*Wistar Institute.*

Postman, L., and H. L. Kaplan, "Reaction Time as a Measure of Retroactive Inhibition,"—*J. Exp. Psychol.*, 1917, 37; 136-145.

Retroactive inhibition (the interference with retention of a previously learned problem resulting from the learning of a new problem) has conventionally been measured by recall, recognition, or the saving method. Since reaction time has been regarded as an index of inhibition in the association technique, it should be useful in measuring slight amounts of interference.

Comparison of the scores of 22 experimental subjects and 22 controls in a verbal learning experiment showed decreasing r. t. in both groups as learning progressed. In the relearning trials the inhibited group showed significant lenthening of r. t. while the r. t. of the controls was shortened. Low correlations between r. t. and loss in retention suggest that they are relatively independent processes.—*F. Henry.*

Shaw, W. A., and L. H. Kline, "A Study of Muscle Action Potentials During the Attempted Solution by Children of Problems of Increasing Difficulty," *J. Exp. Psychol.*, 1947, 37; 146-158.

Other studies have shown that increasing muscle action potentials accompany increasing task difficulty. Analysis of the forearm action potentials of ten boys age 10-14 during the solution of arithmetic problems indicates there is least muscle activity in the most intelligent boys. Increased problem difficulty was associated with increased activity.—*F. Henry.*

Franklin, J. C., and J. Brozek, "The Relation between Distribution of Practice and Learning Efficiency in Psychomotor Performance," *J. Exp. Psychol.*, 1947, 16-24.

Thirty-six men ages 20-33 were tested for gross body movement reaction time while walking on a treadmill. They also performed a pattern-tracing task. Subgroups of 6 men were given 3, 2, or 1 practice periods per day, 3 per week, or irregular practice. Total practice was equal for all groups.

Considerable learning occurred in both tasks. The number of trials required to reach plateau performance bore no relation to the distribution of practice.—*F. Henry.*

McClelland, D. C., and F. S. Apicella, "Reminiscence Following Experimentally Induced Failure," *J. Exp. Psychol.*, 1947, 37, 159-169.

Three groups of 14 male undergraduates practiced card-sorting to a standard criterion. Levels of aspiration were obtained before each trial. Falsified scores were reported to two of the groups in order to induce failure to attain the aspired degree of success. In the after-trials, the "failure" groups required more trials to reach the criterion, because failure produced conflicts that lowered performance below the true level of learning. Reminiscence could not be demonstrated.—*F. Henry.*

Preston, M. C., Anne Spiers, and Joyce Trasoff, "On Certain Conditions Controlling the Realism and Irrealism of Aspirations," *J. Exp Psychol.*, 1947, 37, 48-58.

A dart-throwing experiment was designed for variance analysis, with particular emphasis on difficulty, motivation, level of aspiration, and information available to the subjects. Two duplicate experimental groups were tested separately; each consisted of 32 young women assigned randomly to the experimental conditions.

With unpracticed Ss, both realistic and irrealistic aspirations depended on the difficulty. With preliminary practice, the irrealistic aspirations were detached from any anchoring to the game scores. Hopes seemed to *increase* with increasing task difficulty.—*F. Henry.*

Book Review

The Peckham Experiment. *Innes* Pearse and Lucy Crocker. New Haven: Yale University Press. 1945. 298 pages, $3.50.

The call has been sounded and the cry is being taken up on all sides. It comes from the platform, through the mail, in the papers, and over the radio: everywhere we hear professionals, amateurs, and hawkers crying like fish peddlers, "Health for sale!"

But is it? True, health is fundamental. We must either learn to live by the laws of biology or be eliminated by our ignorance and indolence. It is fortunate that interest is being generated, but it is also important that wisdom direct our enthusiasm into building a health service distinctly apart from any sickness service; otherwise we may be sold just another bill of goods.

But where are the facts? Who knows how to build a health service? Who knows whether families will support a service designed to keep them fit? Who knows whether sickness can be detected beforehand? Who knows whether prevention is possible? Twenty years ago the Halley Stewart Fund made a grant to Dr. G. Scott Williamson for medical and sociological research, and by 1940 he had some of these answers and considerable "know how." In fact, the Peckham experiment was so revolutionary and stirred such widespread interest that its report had to be reprinted four times in two years to supply the demand for facts. The 1944 report was recently received in this country, and it should be read by every person interested in health education, and health insurance.

Dr. Williamson set up the Pioneer Health Center in South London in 1926. By the third year he was convinced that a community would welcome and use such a center if it was based upon biologically sound circumstances. He was sure sickness could be detected, often before the individual had any idea of its presence. Equally important was his third discovery, that the level of fitness of those who showed no disorder was extremely low and could not be raised without the "instruments of health." In other words, a physical examination was ineffective as a health measure in the absence of the conditions and facilities which permit the family to express its biological potentialities.

Fortified with these facts, he and a committee of lay people raised the funds for a new health center. After seven long years of planning, the new center, built to service 2,000 families, was opened in 1935. It offered consultative services as before, but in addition it provided the facilities for the exercise of the physical, mental, and social capacities so necessary for health. It was a physical structure of steel and concrete, but more important it was a social structure based upon a new unit. This new unit was the most important fact of all. It was a biological discovery. In describing it, Dr. Pearse said "We claim to have defined the unit of living. It is not the individual, it is the family." And this idea opened up a whole new field for social experimentation. The rallying point was health.

The plan of action was patterned after a family club, with periodic health overhauls for all members and with the various auxiliary services for infants, children, and parents. The first clue pointing to the necessity for studying health came from the work on epidemiology of infectious disorder. Contrary to belief, susceptibility was not normal; it seemed that persons could be kept well, and this was the basic idea behind the new venture.

By analyzing the results of the first health overhaul for 1,206 families, the experimenters found three distinct states of well being.

1. Thirty-two percent were hampered by disorders known as disease.

2. Fifty-nine percent had disorders of which they were unaware. They were cloaking their disorders through utilizing their reserves to buoy themselves up to a false sense of well being.

3. Nine percent were healthy, that is, living a full, functioning existence and developing according to their native potentialities.

The Peckham community had been selected because it was an average community, and yet 90 percent of the individuals (3,911 had been examined) were not healthy.

A building 160 by 120 feet, three stories high, was carefully designed to house the facilities and activities through which the efficiency and well-being of the community was to be raised. In the center of the building was a 35-by-75-foot swimming pool, visible from each floor through a continuous band of glass. On the ground floor were the nursery, gymnasium, playground, theater, storerooms, and service rooms. The second floor housed the main recreation and dance floor, the cafeteria, and several small activity rooms. On the third floor were the laboratories and consultation rooms, a recreation room, work room, band room, and committee room. The building was properly insulated and soundproofed. Most of the facilities were designed for self-service.

At different times of the day one may see children in the nursery, waders in the pool, toddlers on the swings and slides, and any one or several of the following activities in progress: sewing, handicraft, games, bicycling, keep-fit classes, swimming, billiards, dancing, band, drama, chess, public speaking, tap dancing, boxing, tumbling, roller skating, parties, hiking, luncheon in the cafeteria, and study groups. More recently the center has acquired a farm and camp which provide many week-end activities in the open. The center often accommodates 1,200 persons on Saturday nights. It is open from 2 to 10 P.M. daily except Sunday.

A record of the participation of each individual in every activity is kept by the simple expedient of having each obtain a ticket from the curator. It is signed and dated, and thus the effect of each kind and amount of activity upon the individual can be studied from the records.

The experimenters have been convinced that the major incentives to action are nearness to and sight of the activity. The building was designed with this idea in mind, because activity is fundamental to health. No organism develops normally unless it is active, nor does it remain fit unless the kind and amount of activity is according to its stage of development.

All the activity within the center is voluntary and spontaneous. There is no center hostess, no one to make introductions, very little programming, no herding, coaxing, or guiding to action. Earlier attempts at promotion have been abandoned. Here is the sociologists' insight in operation. Audiences swell to watch the experts, and as the "stars" grow in brilliance the spectators are frozen to inactivity by their growing sense of ineptitude. Not every activity invites attempts to action; only those which appear within the possible scope of the spectator tempt him.

This is the reason for membership on the family basis, the unit of living. In the presence of a vertical age grouping, where youth is surrounded by every stage of maturity and every degree of skill, there are present and natural incentives to development. The children are growing up in families which are expanding their physical, social, and intellectual con-

tacts because of the activities of the center. As the parents penetrate the active society which surrounds them and the child shares their experiences, his confidence expands and he reaches for new forms of activity. This can only come about where the young are in contact with a society which includes people of varying degrees of maturity, possessing varying degrees of accomplishment.

It is unfortunate that so many youth organizations operate on the basis of segregation, for they thus cut off the source of stimulation for the next stage of development. This may be the reason for the failure of so many youth centers. At the health center the older members show a lively interest in the modern aspects of life as they see it in action. The young people reciprocate by rallying to help at every sort of occasion, and their vigor finds expression not in exclusiveness, but in participation in every activity in the center.

In a thousand different ways adolescents are watching and taking part, and are being familiarized with their next step in experience. Views to the contrary notwithstanding, youth is first attracted by the more mature and prefers those older than himself. So, in a situation where mutual interplay is always in progress, the opportunity is given for development in discrimination. Perhaps, therefore, the segregation of adolescents all at the same level of development, where they should be learning from every possible degree of maturity, is one of the worst crimes committed against growing boys and girls.

But where is the rallying point for such an integrated community? Perhaps it is health—not cure of sickness, but fitness. Nearly everything else has been tried and has failed. Possibly in aiming at fitness and having an understanding of the reasons for it, all the persons in the community could be integrated. The benefits are not all physical; they are social and mental as well.

The Peckham experimenters say they have no problem in leadership. How different from the expressions of woe of promoters! "Our members have taught us that leaders need no training." Natural circumstances with available facilities permit natural leaders to emerge. With hundreds in attendance daily, with dozens of activities going on, the only professionals are the curator and the instructor of the keep-fit class. There are two doctors and a laboratory technician who devote their time to the health examination and the family consultation, and there is a midwife who helps each family through the first few days of adjustment after a new baby is born. All the activities in the center are led by volunteer leaders.

Only under artificial conditions which disregard the "natural" leader is training a problem. The solution, however, is not as easy as it sounds. There must be incentives for action, and facilities, and proximity to action, and all degrees of skills in operation; these are the biologically sound bases. Then there must be some means for measuring the progress made by each individual.

Many examples are given in the report, but let us examine just one:

Mr. and Mrs. X had been married seven years and had two children, aged four and two. The wife was fat, flabby, constipated, suspicious, diffident, and negative. The husband was overweight, irritable, and alternating between overconfidence and shyness. The elder child was under-nourished, anemic, nervous, bit her nails, wiggled, lisped, and was conspicuous for her inability to share in the activities of other children. The baby was fat, pale, inactive, listless, unable to walk and talk, and was constantly being pacified by sweets and biscuits.

Before marriage the husband had been a keen boxer and swimmer and had spent considerable time at his club. The wife had been a shop assistant but had failed to attain any skill or

find any adventure in housekeeping.

The family was underactive, physically, mentally, and socially. Both husband and wife were disillusioned—life had become stagnant, if not sour. As devitalized individuals they had tended to move further and further away from living and into the protective level of personal survival. They were existing upon a minimum current account, possessing no reserves, no guarantee that they would reach their achievement. So low was their level that they turned aside from any venture where something new might confront them. A safety-first attitude was limiting their activities.

After joining the center, they had their first health examination and family consultation and decided upon a program. The husband joined the boxing club and within four months was instructing a class of boys. The mother was referred to a gynecologist. Thereafter she went to the keep-fit class and learned to swim. In her struggles in the water she met and became friendly with several other women of about the same skill. Both husband and wife lost weight (they keep the score), they moved about more briskly, and the doctor told them they looked healthier. Eventually they both played badminton with friends and built up a social circle of their own. The wife became interested in her appearance, since she was going out, and learned to sew in the sewing room. With the help of a friend (natural leader), she undertook to make a summer dress—a thing she had never thought of before. Her achievement was noticed by her social circle.

Much attention was given to eradicating the worms which infested the older child. She then gained in weight (she weighed herself each time she came), began to mix with other children, and increased in confidence so that she was able to take part in many playground activities. The baby was brought to the nursery five afternoons a week and within a month learned to walk firmly while her mother was learning to swim. Within six months she was going to the gym and to the babies' pool with the other children. She acquired color and firm muscles and became active mentally, gaining an almost winning personality.

These changes toward a more healthy action came as a result of membership in the center and were not associated with any change in wage level or other economic factor operating upon the family.

The Peckham Center is the only one of its kind in the world. It is not an assemblage of clinics and social workers; it is a center in the community from which the family, the living cell of society, can be sustained in its growth and development. It was built and equipped by voluntary subscriptions of those eager to see the results of an experiment in health rather than sickness. It is maintained by family subscriptions amounting to 28 cents per family per week. All the equipment and services are free to children, but adults pay an additional small fee for use of the various facilities. The budget, the staff, the building, and its equipment are all explained in the 1944 report.

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Ogden, Jean and Jess. Small Communities in Action. New York City: Harper & Brothers, 1946. (books)

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